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BOSTON UNIVERSITY

GRADUATE SCHOOL

Thesis

MENTAL TESTING AS A MEASURE OF ABILITY IN ALGEBRA

by

William Thurlow Alexander

(S.B., Northeastern University, 1931)

submitted in partial fulfilment of the

requirements for the degree of

Master of Arts

1935

Boston, Mass.
March, 1935.

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PREFACE

In the following pages the author presents the results of a comprehensive study of freshmen algebra grades made at the University on whose faculty he serves. In conjunction with the grades in algebra several available tests and scores have been studied. The object is to find out whether or not there is any indicator, available before the course is attempted, which will segregate with a fair degree of reliability those students who will need special attention if they are to successfully complete the course. If any such indicator could be found it is believed that it would be of real value in indicating desirable class sectioning and course content.

The author wishes to express his appreciation to the following men for their most helpful advice and criticism: Dr. Wayland Vaughn, Chairman of Dept. of Psychology, Boston University Graduate School; Prof. Stanley G. Estes, Chairman of Dept. of Psychology, Northeastern University; Prof. Alfred J. Ferretti and Prof. William C. White of Northeastern University.

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INTRODUCTIONChapter 1.

If any subject in the college curriculum is to be taught most effectively it is obviously essential that the course material be sound, but it is almost equally important that the course content be arranged and presented with due regard to the capacities of the particular students. Due to the unavoidable variations in preparation and ability among students, however, the average college class will contain a range of from very keen to very slow students.

It would, therefore, be desirable from the standpoint of educational efficiency to subdivide the heterogeneous large group into smaller groups made up of students of approximately equal absorptive capacity. The major objective of the thesis is to attempt to find means to segregate students in the above fashion. While it is recognized that many external factors beyond the control of college administrations often markedly affect a student's progress in any course, it is believed that benefit would result from a technique which could group together those of nearly equal ability in a certain subject.

The course in college algebra was selected for attention primarily because of its fundamental importance to a course in engineering, since it forms the basis of all higher mathematics.

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The course in college algebra was selected for attention primarily because of its fundamental importance to a course in engineering, since it forms the basis of all higher mathematics.

There are certain arguments both for and against the formation of ability sections which might be discussed briefly, although the school studied is definitely in favor of this system. The problem may be considered as it affects three groups: the school administration, the faculty, and the students.

From the school's point of view, sectioning, regardless of whether or not the groups are formed on the basis of ability difference, increases clerical work, increases class room requirements in certain cases, and in most cases increases the number of faculty members required. The only compensation is the conviction that the greatest good for the group as a whole is being achieved. The increased faculty and classroom load will only be a factor where the numbers of ability levels which are segregated are greater than the usual number of heterogeneous class groups in the particular case studied.

The faculty point of view is influenced by precisely the same factors which affect the school administration. In general, it may be said that splitting up a large class into smaller sections will increase the faculty's class hour load but will enable the instructor to do more thorough work, especially with the better students.

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The above factors operate regardless of the basis used to subdivide the large classes into smaller groups. There are additional phases to be considered when the sections are formed according to variations in ability among the students. These sections will be referred to as "ability sections".

From the standpoint of teaching efficiency it is far better to have all students in the class of the same ability level, so that the keen students will not be slowed down nor the slower ones hurried beyond their most effective rate of absorption. If sections of varying ability are handled by the same instructor, care must be taken in assigning problems and in grading the various groups so that standards of achievement in one group are not carried over into the others. Several educators now advocate the use of different standards for sections of varying ability so that there will be a range of grades, from high to

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unsatisfactory, in each section.

For general scholarship comparisons, with this system, it would be necessary to weight the grades of one section so that they would be comparable with the other grades in the same subject.

Probably the most serious disadvantage in the use of ability sections is the possibility of the development of an inferiority complex in the lowest ability sections. If the students are allowed to become convinced that they cannot learn a certain subject, it will be difficult to get them to exert themselves and real damage to the student's future scholastic success may result.

This undesirable possibility may be eliminated in most cases by careful teaching and proper motivation, so that the low grade sections are at all times considered as opportunity sections rather than penalty sections.

Evidently, with the ability section there is a definite advantage to the better students and the possibility of disadvantage to the poor students. It seems that more good will result to society as a whole if the best students are given a chance to develop their powers to the utmost, rather than that they should be handicapped, so as to give a doubtful advantage to those least qualified to benefit from it.

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from it.

It was decided to study the records of all freshmen engineering students entering in September over a period of five years, including the classes of 1938, 1937, 1936, 1935 and 1934, and comprising 1275 individual cases.

By a preliminary survey the following test scores and data were found to be available: Well's Revision of Army Alpha Test scores for classes of 1938 and 1937; the original Army Alpha test scores for the classes of 1936, 1935 and 1934; University of Iowa algebra placement test scores for class of 1937; Algebra placement test scores for four classes made on a standard test devised at the University where the study is being made; High School algebra grades and total high school scholastic average for all students; College algebra grades for all students; and for one class scores on the Bernreuter Personality Inventory test BI-M. It is believed that these tests if studied carefully should give useful relations which could be used to indicate those students who will probably do well in algebra if properly motivated and those who will probably need special attention. It should continually be borne in mind that a grade or a test score may be very inaccurate in predicting ability and preparation in any individual case and that they only become of value when large groups of cases are studied.

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and obtain a coefficient of correlation for the cases where a relation was believed to exist.

Students of statistics have devised several empirical formulae for obtaining a coefficient of correlation between two sets of data. Correlation by the "Product Moment" method or Pearson method was selected for use as it seems to have a more sound mathematical basis than some of the other methods available. Due to their averaging feature, which balances the high scores against the low scores, all methods of correlation have the weakness of giving only an average result or the trend of a group of figures. The range of variation of data above and below average, as well as the amount of this variation must be found by other means.

One convenient method of doing this is by use of the Ogive Curve which shows at a glance the numbers of cases which are above or below a certain figure.

No complete discussion of correlation theory will be included here as it is readily available in the books listed in the bibliography or in other standard references on statistics.

A brief outline, however, may be useful in contributing to an understanding of the later pages.

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The coefficient of correlation or "r" expresses the mathematical relation between two sets of data and may have a possible range of value from -1 to +1. An "r" of 0 shows a complete absence of relation between the data. A value of -1 shows a reverse or inverted relation and a value of +1 shows a perfect direct relation. An example may make this more clear.

Suppose the weight and height of 100 students were measured and the sets of results compared. If each tall man was found to be heavier than his next shorter neighbor and each short man was lighter than his next taller neighbor a perfect positive correlation would exist and the value of r would be +1. Conversely, if each tall man was lighter than his shorter neighbor and each short man was heavier than any man who was taller than he, a perfect negative correlation would exist and r would equal -1. If equal numbers of tallest men were lightest, and shortest men were heaviest no relation would exist between the weight and height and r would equal 0.

If all of the above data were assembled and plotted as a graph with the heights as ordinates or Y-variables and the weights as abscissae or X-variables, two sets of points might result, one of the mean height from each height interval plotted against their average weight, the other of the mean weight from each weight interval plotted against its average height.

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If all of the above data were assembled and plotted as a graph with the heights as ordinates or Y-variables and the weights as abscissae or X-variables, two sets of points might result, one of the mean height from each height interval plotted against their average weight, the other of the mean weight from each weight interval plotted against its average height.

If the best possible average line be drawn through each set of points, these lines may be referred to a pair of coordinate axes, the Y axis drawn vertically through the mean value of the weight scale and the X axis drawn horizontally through the mean value on the height scale.

To find the correlation of the two values from this plot, select any convenient point on one of the sloping average lines, find the distances of this point from the coordinate axes, the ratio of these distances is "r" the coefficient of correlation. Different values of slope of the slant lines give possible ranges of r from -1, through 0, to +1. In other words, the coefficient is a ratio showing relative variations between two variable quantities.

This graphical method is of little practical value but gives a more clear picture of the real meaning of "correlation".

For practical correlation calculations, Prof. Karl Pearson has developed the equations of the slanting lines mentioned above and has derived a mathematical formula which expresses the value of "r" in terms of "x" and "y", the deviations of the variables from their mean values.

This formula has two common forms, one for use when a "Guessed average" is assumed and the equation later corrected for errors of estimate, the other form is used when the arithmetic mean is used and no correction need be made for errors of estimation.

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The latter form which will be used for all calculations in the following pages is as follows:

$$r = \frac{\sum xy}{\sqrt{\sum x^2} \cdot \sqrt{\sum y^2}} \quad \text{where } x \text{ and } y \text{ are the deviations from their means of two sets of data.}$$

When it is desired to know the accuracy of r its "Probable Error" may be found by the following equation:

$$\text{P.E.} = \frac{0.6745 \times (1-r^2)}{\sqrt{N}} \quad \text{where } N \text{ is no. of cases studied.}$$

This signifies that the chances are even that the true correlation coefficient lies within the limits of the calculated value plus or minus its P.E. To be certain that there is any correlation present a value of r must be at least four times its P.E.. To be certain of a low degree of correlation an obtained r should be five or six times its P.E.(1)

Strictly speaking, only coefficients of 0.95 or above should be referred to as "high correlation".² However, in mental and educational measurements there are so many sources of error, both actual and potential, due to the extreme variability of the material studied and the frequent inaccuracy and crudity of measurement there are few cases of really high correlation. From experience it seems justifiable to regard .70 or .75 as high, and while following relations are not exact they may serve generally as a guide.

1. Statistics in Psychology & Ed. by H. E. Garrett, Pg.170.

2. Statistics in Psychology & Ed., Page 298.

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r from $\pm .40$ to $\pm .70$ marked relationship.

r from $\pm .70$ to ± 1.00 extremely high correlation.

These values will be kept in mind when studying and drawing conclusions from the calculations in the following pages.

In order to make their results more readily understandable and comparable with different forms, statisticians use several kinds of curves or graphs. Some of the most important of these are the frequency polygon, the histogram, the ogive curve, the normal probability curve, and the comparative line graph.

To form a frequency polygon the scores which are to be studied are tabulated, the scores are laid out as abscissae, and their frequencies as ordinates. Plotting the midpoint of each step interval against the number of times this score appears, will give a series of points starting and ending on the X-axis. If these points are connected in order by straight lines, the resulting shape is called a frequency polygon. The total frequency of distribution is represented by the area of the polygon. The mode is easily located as the highest point on the surface but the mean and median, if desired, must be located on the X-axis, and perpendiculars erected at the proper points.

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The histogram or column diagram uses the same date and coordinate axes as the frequency diagram. In plotting this curve, however, it is assumed that all scores in a given interval are distributed uniformly over the entire interval.

Consequently, the measures in any interval are represented as a rectangle whose base is the length of the step interval and with a height equivalent to the number of scores in the interval. These rectangles may be made completely or they may be joined together to form a stepped aggregate diagram. The uses of this curve are the same as the frequency polygon but in this case each rectangle is directly proportional to the number of measures in the interval. With a symmetrical distribution of scores both of these curves tend to approach the normal probability curve.

In the ogive or cumulative frequency graph the data is assembled and divided into a convenient number of step-intervals.

In plotting, the scores are the abscissae and the ordinates are the cumulative frequencies of occurrence of the scores. With a "normal" distribution of scores the curve will start with a slight slope, climb steeply in its middle, and then tend to level out near the end. For convenience in reading, the ordinate usually reads both in frequency and in percent. The ogive curve although less frequently used has several good features: percentages may be easily read from the curve, the shape of the curve does not change as

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the step intervals are varied, and curves with different step intervals may be compared directly.

If a large number of measures of any variable quantity are assembled it will be found that there are but few measures of very high or of very low value, while there will be a large number of measures in the middle range of values. If these scores are plotted against their frequency of occurrence and a smooth curve drawn through the points, the result will be bell shaped normal probability curve. This curve is theoretically perfectly symmetrical bilaterally so the mean, the median, and the mode all fall at the same point.

The last of the graphical methods to be discussed, the comparative line curve, is simply a plot of the variation of one group of data with respect to another group under consideration. These curves may be of any size or shape and are broken line curves plotted from point to point. They are frequently used to show the rate of learning or forgetting with respect to time, to show rate of progress on a certain job or project, and to compare the rates of performance or improvement of two different groups.

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The preceding brief discussion is not designed to give complete information about the use of curves in statistics

nor to make the reader skilled in using graphical methods but to set up a background of general information against which the later curves may be compared.

Since the grades which are to be studied in this work are given on a letter basis, it will be necessary to convert them to a numerical basis for purposes of correlation. The grades are given as A, B, C, D, F, and FF, and while they have no direct numerical equivalents it is believed that the substitution of 95, 85, 75, 65, 50 and 35 for the letters will convey the intent of the grade and give figures which may be easily studied and manipulated.*

In the following chapters will be included the various sets of data which it is desirable to study together with their correlation graphs, and conclusions drawn.

* It is recognized that this arbitrary assignment of values to the letter grades will not give exact results in all cases. This is primarily due to the fact that actually there is not the same interval between the grades A, B, C, etc. as is assumed by letting them equal 95, 85, 75, etc. It would be necessary to weight each letter grade given by each instructor and to find the true interval between each consecutive letter grade to obtain the greatest possible accuracy.

After a conference with Prof. Chamberlin of Boston University, however, it was decided not to change the basis which had originally been used to convert the letter grades

not to make the reader skilled in using graphical methods
 but to set up a background of general information against
 which the later curves may be compared.

Since the grades which are to be studied in this work
 are given on a letter basis, it will be necessary to con-
 vert them to a numerical basis for purposes of correlation.
 The grades are given as A, B, C, D, E, and F, and while
 they have no direct numerical equivalent it is believed
 that the substitution of 95, 85, 75, 65, 55 and 45 for the
 letters will convey the intent of the grade and give figures
 which may be easily studied and manipulated.*

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Chapter II

to numerical values.

It has long been believed by educators that a student's preparation for certain courses can be rather definitely determined by his performance on a carefully designed pretest which contains a wide range of questions of varying difficulty.

Accordingly, for several years all freshmen have been required to take an algebra pretest, upon entering, the results of which are used in dividing the entire group into small algebra sections. The various sections are treated differently according to their various capacities but all take the same quizzes and have final examinations so their grades should be comparable.

The type of examination used prior to the year of 1937 was developed by the chairman of the mathematics department at the same university. This pretest consisted of four pages of questions, thirty-two in number, ranging in difficulty from rather elementary problems to some of considerable difficulty. It was apparently quite effective in selecting those persons who were at least potentially able to study advanced algebra. As an algebra pretest this was single to administer and easy to correct.

Beginning with the class of 1938, however, the mathematics department looked around to see if some other test might not give better results. The placement test devised and published

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Chapter II.Predictive Value of Algebra Pretest.

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lished by the University of Iowa was decided upon and was tried for that year. This test is apparently rather effective in predicting future performance but is considerably more difficult to administer and correct than the original form used. Moreover, as far as could be determined from a careful check on results it was no more accurate than the earlier form. Consequently, the University of Iowa test was abandoned after one year's use.

By correlating the scores made on these algebra placement tests with the final grades in algebra it should be possible to see which type of test is more effective and whether or not the University of Iowa test is worth its additional trouble and expense. It must be borne in mind that the grades of the various algebra sections are comparable only as long as the same tests are given to each group and when no attempt is made to get a "normal curve" grade distribution in each section.

In all correlations in the following pages the long method is used and the correlation equations used were devised by Pearson according to the Product-Moment method.

6	8	-1.44	-1.00	.12	2.57	-1.25
8	7	-1.00	-2.25	2.43	0.35	4.01
9	10	+ .64	+ .11	.12	.01	.00
10	10	+ .64	+ .11	.12	.01	+ .00
11	12	+1.44	+2.11	2.07	2.43	2.04
12	13	+2.44	+2.11	2.95	2.57	7.54
41.	49.			10.31	10.57	20.46
4.58	4.03					

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In order to make clear the symbols used in the following pages and illustrate their use a type problem will be solved.

Assume two sets of data to be correlated are as tabulated below in columns 1 and 2. One set is to be called X values and the other set Y values. Either set of data may be designated as X. The sum of all X measures is 41 and the sum of all Y measures is 89. The number of measures, N, equals 9. The arithmetic mean of the X column is $\frac{41}{9}$ or 4.56 and that of the Y column is $\frac{89}{9}$ or 8.98, both to the nearest two significant figures. Columns 3 and 4 are completed by letting the values x and y represent the variation of each X or Y measure from the mean value of the group of X or Y scores. The variation will be called positive or negative depending upon whether the particular value is greater or less than the mean of the group.

1	2	3	4	5	6	7	
X	Y	x	y	x^2	y^2	xy	
3	9	-1.56	- .89	2.43	.79	1.39	
2	9	-3.56	- .89	12.67	.79	3.17	
6	11	+1.44	+1.11	2.07	1.23	1.60	
5	8	+ .44	-1.89	.19	3.57	- .83	
3	7	-1.56	-2.89	2.43	8.35	4.51	
5	10	+ .44	+ .11	.19	.01	.05	
4	10	- .56	+ .11	.31	.01	- .06	
6	12	+1.44	+2.11	2.07	4.45	3.04	
7	13	+2.44	+3.11	5.95	9.67	7.59	
9 41.	9 89.			28.31	28.87	20.46	Sum
4.56	9.89						Mean

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Assume two sets of data to be correlated are as tabulated below in columns 1 and 2. One set is to be called X values and the other set Y values. Either set of data may be designated as X. The sum of all X measures is 41 and the sum of all Y measures is 39. The number of measures, N , equals 9. The arithmetic mean of the X column is $\frac{41}{9}$ or 4.55 and that of the Y column is $\frac{39}{9}$ or 4.33, both to the nearest two significant figures. Columns 3 and 4 are completed by finding the values x and y represent the variation of each X or Y measure from the mean value of the group of X or Y scores. The variation will be called positive or negative depending upon whether the particular value is greater or less than the mean of the group.

1	2	3	4	5	6	7
X	Y	x	y	x^2	y^2	xy
3	9	-1.55	-.89	2.42	.79	-1.39
2	9	-2.55	-.89	6.51	.79	-2.17
5	11	+1.44	+1.11	2.07	1.23	2.20
5	8	+.44	-1.89	.19	3.57	-.83
3	7	-1.55	-2.89	2.42	8.35	-4.51
5	10	+.44	+.11	.19	.01	.05
4	10	-.55	+.11	.31	.01	-.06
5	12	+1.44	+2.11	2.07	4.45	3.04
7	12	+2.44	+3.11	5.95	9.67	7.59
Sum	9	9		28.31	28.87	20.46
Mean	4.55	4.33				

Columns 5 and 6 are completed by squaring the figures in columns 3 and 4. All values in these columns of squares will be positive.

The values for column 7 are obtained by multiplying together each value of x , the variation of X from the mean of the X s, by the corresponding value of y , the variation of Y from the mean of the Y group. The sign of the xy term will be either positive or negative depending upon the signs of the particular values of x and y used.

In order to correlate the two original sets of data by use of Pearson's Product moment equation it is necessary to know the algebraic sums of the x^2 , y^2 , and xy columns. The sums are found to be 28.31, 28.87, and 20.46 respectively.

The correlation equation according to Pearson is as follows:

$$r = \frac{\sum xy}{\sqrt{\sum x^2} \times \sqrt{\sum y^2}} \quad (1) \quad \text{The symbol } \sum \text{ means "summation".}$$

Substituting the tabulated values, the equation becomes:

$$r = \frac{20.46}{28.31 \times 28.87} = \frac{20.46}{5.32 \times 5.37} =$$

$$\frac{20.46}{28.57} = \underline{0.716}$$

The probable error of the calculated value of r may be found from

$$P. E. = \frac{.6745 \times (1-r^2)}{\sqrt{N}} \quad (1)$$

Columns 5 and 6 are completed by subtracting the figures in columns 3 and 4. All values in these columns of squares will be positive.

The values for column 7 are obtained by multiplying together each value of x , the variation of X from the mean of the X s, by the corresponding value of y , the variation of Y from the mean of the Y group. The sign of the xy term will be either positive or negative depending upon the signs of the particular values of x and y used.

In order to correlate the two original sets of data by use of Pearson's Product Moment equation it is necessary to know the algebraic sums of the x^2 , y^2 , and xy columns. The sums are found to be 28.31, 28.87, and 20.45 respectively.

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$$r = \frac{\sum xy}{\sqrt{\sum x^2} \times \sqrt{\sum y^2}}$$
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Substituting the tabulated values, the equation becomes:

$$r = \frac{20.45}{28.31 \times 28.87} = \frac{20.45}{818.8717} = 0.025$$

The probable error of the calculated value of r may

$$\text{be found from P. E.} = \frac{.6745 \times (1-r^2)}{\sqrt{n}} \quad (1)$$

Substituting the calculated values;

$$P.E. = \frac{.6745 \times (1-.513)}{\sqrt{9}} = \frac{.328}{3} = 0.109$$

It may be seen from the above results that there is a high degree of correlation between the two sets of data studied as shown by a positive coefficient of correlation of 0.716. (2)

The magnitude of the probable error depends upon the value of the coefficient of correlation and upon the number of cases studied. Since the probable error varies inversely as the number of cases, the small number of measures in the illustrative problem causes a higher probable error than will be found in the calculations to follow.

All correlations studied in this thesis will be treated in the same manner as the above illustrative problem.

(2) See page 9.

Substituting the calculated values:

$$P.E. = \frac{.8745 \times (1-.613)}{\sqrt{2}} = \frac{.268}{2} = 0.109$$

It may be seen from the above results that there is a high degree of correlation between the two sets of data studied as shown by a positive coefficient of correlation of 0.716. (2)

The magnitude of the probable error depends upon the value of the coefficient of correlation and upon the number of cases studied. Since the probable error varies inversely as the number of cases, the small number of cases in the illustrative problem causes a higher probable error than will be found in the calculations to follow.

All correlations studied in this thesis will be treated

in the same manner as the above illustrative problem.

TABLE II a (1938)

Correlation of Algebra Test Scores and Algebra Final Grades

No.	X	Y	x	y	x ²	y ²	xy
1	--	--	---	---	---	---	---
2	20	75	- 1.2	.7	1.44	.49	- .84
3	18	65	- 3.2	- 9.3	10.24	86.49	29.76
4	16	50	- 5.2	-24.3	27.04	590.49	126.36
5	30	85	8.8	10.7	77.44	114.49	94.16
6	28	75	6.8	.7	46.24	.49	4.76
7	18	65	- 3.2	- 9.3	10.24	86.49	29.76
8	30	85	8.8	10.7	77.44	114.49	94.16
9	24	85	2.8	10.7	7.84	114.49	29.96
10	11	40	-10.2	-34.3	104.04	1176.49	349.86
11	15	65	- 6.2	- 7.3	38.44	86.49	45.26
12	3	50	-18.2	-24.3	331.24	590.49	442.26
13	16	65	- 5.2	- 9.3	27.04	86.49	48.36
14	--	--	---	---	---	---	---
15	19	50	- 2.2	-24.3	4.84	590.49	53.46
16	24	85	2.8	10.7	7.84	114.49	29.96
17	26	85	4.8	10.7	23.04	114.49	51.36
18	19	75	- 2.2	.7	4.84	.49	- 1.54
19	16	75	- 5.2	.7	27.04	.49	- 3.64
20	22	85	.8	10.7	.64	114.49	8.56
21	23	85	1.8	10.7	3.24	114.49	19.26
22	32	95	10.8	20.7	116.64	428.49	223.56
23	11	50	-10.2	-24.3	104.04	590.49	247.86
24	31	95	9.8	20.7	96.04	428.49	202.86
25	30	75	8.8	.7	77.44	.49	6.16
26	25	85	3.8	10.7	14.44	114.49	40.66
27	25	85	3.8	10.7	14.44	114.49	40.66
28	19	75	- 2.2	.7	4.84	.49	- 1.54
29	28	85	6.8	10.7	46.24	114.49	72.76
30	9	50	-12.2	-24.3	148.84	590.49	296.46
31	12	75	- 9.2	.7	84.64	.49	- 6.44
32	19	65	- 2.2	- 9.3	4.84	86.49	20.46
33	23	75	1.8	.7	3.24	.49	1.26
34	23	85	1.8	10.7	3.24	114.49	19.26
35	20	65	- 1.2	- 9.3	1.44	86.49	11.16
36	26	65	4.8	- 9.3	23.04	86.49	- 44.64
37	20	75	- 1.2	.7	1.44	.49	- .84
38	27	95	5.8	20.7	33.64	428.49	120.06
39	28	95	6.8	20.7	46.24	428.49	140.76
40	29	95	7.8	20.7	60.84	428.49	161.46
41	19	75	- 2.2	.7	4.84	.49	- 1.54
42	22	75	.8	.7	.64	.49	.56
43	18	85	- 3.2	10.7	10.24	114.49	- 34.24
44	25	75	3.8	.7	14.44	.49	2.76
45	9	65	-12.2	- 9.3	148.84	86.49	115.46
46	29	95	7.8	20.7	60.84	428.49	161.46

TABLE 11 - (1938)

Correlation of Algebra Test Scores and Algebra Final Grades

No.	X	Y	X	Y	X	Y	X	Y
1	80	75	1.44	7	1.3	-	84	84
2	18	65	10.24	9.3	8.6	-	85	84
3	16	60	25.64	24.3	8.6	-	86	84
4	30	85	7.84	10.7	8.8	-	87	84
5	28	75	46.24	7	8.8	-	88	84
6	18	65	10.24	9.3	8.8	-	89	84
7	30	85	7.84	10.7	8.8	-	90	84
8	24	85	7.84	10.7	8.8	-	91	84
9	11	40	104.04	34.3	10.2	-	92	84
10	15	65	22.44	7.3	8.8	-	93	84
11	16	60	25.64	24.3	8.8	-	94	84
12	16	65	25.64	24.3	8.8	-	95	84
13	16	65	25.64	24.3	8.8	-	96	84
14	19	60	36.1	8.8	8.8	-	97	84
15	24	85	10.24	10.7	8.8	-	98	84
16	28	85	7.84	10.7	8.8	-	99	84
17	31	95	9.61	10.7	8.8	-	100	84
18	19	75	36.1	7	8.8	-	101	84
19	16	75	25.64	7	8.8	-	102	84
20	22	85	10.24	10.7	8.8	-	103	84
21	22	85	10.24	10.7	8.8	-	104	84
22	22	95	10.24	10.7	8.8	-	105	84
23	11	50	104.04	34.3	10.2	-	106	84
24	31	95	9.61	10.7	8.8	-	107	84
25	30	75	7.84	10.7	8.8	-	108	84
26	28	85	7.84	10.7	8.8	-	109	84
27	28	85	7.84	10.7	8.8	-	110	84
28	19	75	36.1	7	8.8	-	111	84
29	28	85	7.84	10.7	8.8	-	112	84
30	9	60	81	3	18.2	-	113	84
31	18	75	32.4	7	8.8	-	114	84
32	19	65	36.1	9.3	8.8	-	115	84
33	22	75	46.24	7	8.8	-	116	84
34	22	85	46.24	7	8.8	-	117	84
35	30	95	9.61	10.7	8.8	-	118	84
36	30	95	9.61	10.7	8.8	-	119	84
37	30	95	9.61	10.7	8.8	-	120	84
38	27	95	13.29	10.7	8.8	-	121	84
39	28	95	7.84	10.7	8.8	-	122	84
40	29	95	8.41	10.7	8.8	-	123	84
41	19	75	36.1	7	8.8	-	124	84
42	22	75	46.24	7	8.8	-	125	84
43	18	85	32.4	10.7	8.8	-	126	84
44	28	75	7.84	10.7	8.8	-	127	84
45	9	65	81	3	18.2	-	128	84
46	29	95	8.41	10.7	8.8	-	129	84

TABLE II a (1938)

No.	X	Y	x	y	x ²	y ²	xy
47	27	95	5.8	20.7	33.64	428.49	120.06
48	17	50	- 4.2	-24.3	17.64	590.49	102.06
49	11	65	-10.2	- 9.3	104.04	86.49	94.86
50	--	--	----	----	----	----	----
51	14	75	- 7.2	.7	51.84	.49	- 5.04
52	16	65	- 5.2	- 9.3	27.04	86.49	48.36
53	26	95	4.8	20.7	23.04	428.49	99.36
54	17	85	- 4.2	10.7	17.64	114.49	- 44.94
55	--	--	----	----	----	----	----
56	18	75	- 3.2	.7	10.24	.49	- 2.24
57	26	75	4.8	.7	23.04	.49	3.36
58	25	95	3.8	20.7	14.44	428.49	78.66
59	28	95	6.8	20.7	46.24	428.49	140.76
60	17	65	- 4.2	- 9.3	17.64	86.49	39.06
61	8	65	-13.2	- 9.3	174.24	86.49	122.76
62	23	75	1.8	.7	3.24	.49	1.26
63	16	65	5.2	- 9.3	27.04	86.49	48.36
64	17	65	- 4.2	- 9.3	17.64	86.49	39.06
65	27	95	5.8	20.7	33.64	428.49	120.06
66	23	95	1.8	20.7	3.24	428.49	37.26
67	25	85	3.8	10.7	14.44	114.49	40.66
68	16	75	- 5.2	.7	27.04	.49	- 3.64
69	31	95	9.8	20.7	96.04	428.49	202.86
70	17	75	- 4.2	.7	17.64	.49	- 2.94
71	22	75	.8	.7	.64	.49	.56
72	11	50	-10.2	-24.3	104.04	590.49	247.86
73	--	--	----	----	----	----	----
74	29	95	7.8	20.7	60.84	428.49	161.46
75	19	75	- 2.2	.7	4.84	.49	- 1.54
76	20	75	- 1.2	.7	1.44	.49	- .84
77	25	85	3.8	10.7	14.44	114.49	40.66
78	31	95	9.8	20.7	96.04	428.49	202.86
79	18	75	- 3.2	.7	10.24	.49	- 2.24
80	26	85	4.8	10.7	23.04	114.49	51.36
81	22	65	.8	- 9.3	.64	86.49	- 7.44
82	23	75	1.8	.7	3.24	.49	1.26
83	30	85	8.8	10.7	77.44	114.49	94.16
84	28	75	6.8	.7	46.24	.49	4.76
85	14	65	- 7.2	- 9.3	51.84	86.49	66.96
86	28	95	6.8	20.7	46.24	428.49	140.76
87	5	50	-16.2	-24.3	262.44	590.49	393.66
88	29	75	7.8	.7	60.84	.49	5.46
89	31	85	9.8	10.7	96.04	.49	104.86
90	26	75	4.8	.7	23.04	.49	3.36
91	27	85	5.8	10.7	33.64	114.49	62.06
92	24	65	2.8	- 9.3	7.84	86.49	- 26.04
93	9	50	-12.2	-24.3	148.84	590.49	296.46
94	30	85	8.8	10.7	77.44	114.49	94.16

TABLE II (1938)

1938	1937	1936	1935	1934	1933	1932	1931
47	27	38	3.8	30.7	33.84	438.43	180.08
48	17	30	- 4.3	- 34.5	17.84	330.43	103.08
49	11	35	- 10.3	- 9.3	104.04	38.43	34.88
50	--	--	--	--	--	--	--
51	14	75	- 7.3	7	51.84	43	- 1.04
52	16	88	- 8.3	- 9.3	37.04	38.43	43.38
53	25	93	4.8	30.7	33.04	438.43	39.78
54	17	85	- 4.3	10.7	17.84	114.43	- 44.34
55	--	--	--	--	--	--	--
56	18	78	- 3.3	7	10.84	43	- 3.34
57	29	75	4.8	7	33.04	43	3.78
58	33	95	3.8	30.7	14.44	438.43	78.88
59	35	95	6.8	30.7	48.34	438.43	140.78
60	17	85	- 4.3	- 9.3	17.84	38.43	73.08
61	8	85	- 13.3	- 9.3	174.34	38.43	133.78
62	23	75	1.8	7	3.34	43	1.38
63	16	85	- 3.3	- 9.3	37.04	38.43	43.38
64	17	85	- 4.3	- 9.3	17.84	38.43	39.08
65	27	95	6.8	30.7	3.34	438.43	130.08
66	32	95	1.8	30.7	3.34	438.43	37.38
67	36	95	3.8	10.7	14.44	114.43	40.88
68	13	75	- 3.3	7	37.04	43	- 3.84
69	31	95	9.8	30.7	38.04	438.43	303.88
70	17	75	- 4.3	7	17.84	43	- 3.34
71	32	75	6	7	3.34	43	3.38
72	11	50	- 10.3	- 34.5	104.04	330.43	347.88
73	--	--	--	--	--	--	--
74	33	95	7.8	30.7	80.84	438.43	161.48
75	19	75	- 3.3	7	4.84	43	- 1.84
76	30	75	- 1.3	7	1.44	43	1.84
77	35	85	3.8	10.7	14.44	114.43	40.38
78	31	95	9.8	30.7	38.04	438.43	303.88
79	18	75	- 3.3	7	10.84	43	- 3.34
80	32	85	4.8	10.7	33.04	114.43	51.38
81	32	85	6	- 9.3	6.34	38.43	- 7.44
82	32	75	1.8	7	3.34	43	1.38
83	30	85	6.8	10.7	77.44	114.43	34.18
84	38	75	6.8	7	69.34	43	6.78
85	14	65	- 7.3	- 9.3	51.84	38.43	55.38
86	38	95	6.8	30.7	48.34	438.43	140.78
87	3	50	- 13.3	- 34.5	303.44	330.43	347.88
88	33	75	7.8	7	60.84	43	6.48
89	31	85	9.8	10.7	38.04	43	103.88
90	36	75	4.3	7	33.04	43	3.38
91	37	85	3.8	10.7	33.04	114.43	33.08
92	34	85	- 3.3	- 9.3	7.84	38.43	- 38.04
93	3	50	- 13.3	- 34.5	148.84	330.43	338.48
94	30	85	6.8	10.7	77.44	114.43	34.18

TABLE III a (1938)

No.	X	Y	x	y	x ²	y ²	xy
95	--	--	---	---	---	---	----
96	10	75	-11.2	.7	125.44	.49	- 7.84
97	13	85	- 8.2	10.7	67.24	114.49	- 87.74
98	26	85	4.8	10.7	23.04	114.49	51.36
99	21	65	- .2	- 9.3	.04	86.49	1.86
100	29	95	7.8	20.7	60.84	428.49	161.46
101	27	95	5.8	20.7	33.64	428.49	120.06
102	18	85	- 3.2	10.7	10.24	114.49	- 34.24
103	6	40	-15.2	-34.3	231.04	1176.49	518.36
104	--	--	----	----	----	----	----
105	23	65	1.8	- 9.3	3.24	86.49	- 16.74
106	13	65	- 8.2	- 9.3	67.24	86.24	76.26
107	27	75	5.8	.7	33.64	.49	4.06
108	26	85	4.8	10.7	23.04	114.49	51.36
109	--	--	----	----	----	----	----
110	20	50	- 1.2	-24.3	1.44	590.49	29.16
111	22	85	.8	10.7	.64	114.49	8.56
112	14	65	- 7.2	- 9.3	51.84	86.49	66.96
113	29	85	7.8	10.7	60.84	114.49	83.46
114	30	95	8.8	20.7	77.44	428.49	182.16
115	12	65	- 9.2	- 9.3	84.64	86.49	85.56
116	13	40	- 8.2	-34.3	67.24	1176.49	281.26
117	24	75	2.8	.7	7.84	.49	1.96
118	19	65	- 2.2	- 9.3	4.84	86.49	20.46
119	19	95	- 2.2	20.7	4.84	428.49	- 45.54
120	19	75	- 2.2	.7	4.84	.49	- 1.54
121	16	65	- 5.2	- 9.3	27.04	86.49	48.36
122	23	95	1.8	20.7	3.24	428.49	37.26
123	16	50	- 5.2	-24.3	27.04	590.49	126.36
124	31	95	9.8	20.7	96.04	428.49	202.86
125	21	85	- .2	10.7	.04	114.49	- 2.14
126	7	75	-14.2	.7	201.64	.49	- 9.94
127	13	65	- 8.2	- 9.3	67.24	86.49	76 .26
128	30	95	8.8	20.7	77.44	428.49	182.16
129	18	85	- 3.2	10.7	10.24	114.49	- 34.24
130	23	85	1.8	10.7	3.24	114.49	19.26
131	30	95	8.8	20.7	77.44	428.49	182.16
132	13	75	- 8.2	.7	67.24	.49	- 5.74
133	30	95	8.8	20.7	77.44	428.49	182.16
134	29	75	7.8	.7	60.84	.49	5.46
135	--	--	---	---	----	----	----
136	30	65	8.8	- 9.3	77.44	86.49	- 81.84
137	29	65	7.8	- 9.3	60.84	86.49	- 72.54
138	29	85	7.8	10.7	60.84	114.49	83.46
139	4	40	-17.2	-34.3	295.84	1176.49	589.96
140	30	95	8.8	20.7	77.44	428.49	122.16
141	30	85	8.8	10.7	77.44	114.49	94.16
142	29	95	7.8	20.7	60.84	428.49	161.46

TABLE II a (1938)

No.	X	Y	x	y	x ²	y ²	xy
143	2	50	-19.2	-24.3	368.64	590.49	466.56
144	20	75	- 1.2	.7	1.44	.49	- .84
145	25	95	3.8	20.7	14.44	428.49	78.66
146	13	65	- 8.2	- 9.3	67.24	86.49	76.26
147	26	65	4.8	- 9.3	23.04	86.49	- 44.64
148	30	95	8.8	20.7	77.44	428.49	182.16
149	10	65	-11.2	- 9.3	125.44	86.49	104.16
150	26	75	4.8	.7	23.04	.49	3.36
151	29	85	7.8	10.7	60.84	114.49	83.46
152	16	65	- 5.2	- 9.3	27.04	86.49	48.36
153	22	75	.8	.7	.64	.49	.56
154	21	75	- .2	.7	.04	.49	- .14
155	30	95	8.8	20.7	77.44	428.49	182.16
156	14	40	- 7.2	-34.3	51.84	1176.49	246.96
157	28	85	6.8	10.7	46.24	114.49	72.76
158	16	85	- 5.2	10.7	27.04	114.49	- 55.64
159	28	85	6.8	10.7	46.24	114.49	72.76
160	20	65	- 1.2	- 9.3	1.44	86.49	11.16
161	8	65	-13.2	- 9.3	174.24	86.49	122.76
162	13	50	- 8.2	-24.3	67.24	590.49	189.26
163	20	65	- 1.2	- 9.3	1.44	86.49	11.16
164	19	65	- 2.2	- 9.3	4.84	86.49	20.46
165	20	85	- 1.2	10.7	1.44	114.49	- 12.84
166	28	75	6.8	.7	46.24	.49	4.76
167	29	65	7.8	- 9.3	60.84	86.49	- 72.54
168	10	50	-11.2	-24.3	125.44	590.49	272.16
169	14	65	- 7.2	- 9.3	51.84	86.49	66.96
170	14	50	-7.2	-24.3	51.84	590.49	174.96
171	22	85	.8	10.7	.64	114.49	8.56
172	9	65	-12.2	- 9.3	148.84	86.49	113.46
173	25	75	3.8	.7	14.44	.49	2.66
174	22	75	.8	.7	.64	.49	.56
175	19	75	- 2.2	.7	4.84	.49	- 1.54
176	16	50	- 5.2	-24.3	27.04	590.49	126.36
177	19	85	- 2.2	10.7	4.84	114.49	- 23.54
178	28	85	6.8	10.7	46.24	114.49	72.76
179	9	65	-12.2	- 9.3	148.84	86.49	113.46
180	27	75	5.8	.7	33.64	.49	4.06
181	22	75	.8	.7	.64	.49	.56
182	28	85	6.8	10.7	46.24	114.49	72.76
183	5	40	-16.2	-34.3	262.44	1176.49	555.66
184	25	75	3.8	.7	14.44	.49	2.66
185	20	85	- 1.2	10.7	1.44	114.49	- 12.84
186	25	75	3.8	.7	14.44	.49	2.66
187	29	85	7.8	10.7	60.84	114.49	83.46
188	--	--	---	----	----	----	----
189	31	95	9.8	20.7	96.04	428.49	202.86
190	24	65	2.8	- 9.3	7.84	86.49	- 26.04

TABLE II a (1958)

No.	X	Y	x	y	X	Y	x	y
145	8	50	-19.8	-24.3	50.04	49.84	50.04	49.84
144	20	75	-1.8	7.	49.84	49.84	49.84	49.84
143	25	95	5.8	20.7	49.84	49.84	49.84	49.84
142	15	85	-8.8	-9.3	49.84	49.84	49.84	49.84
141	25	95	4.8	-9.3	49.84	49.84	49.84	49.84
140	30	95	8.8	20.7	49.84	49.84	49.84	49.84
139	10	65	-11.8	-9.3	49.84	49.84	49.84	49.84
138	25	75	4.8	7.	49.84	49.84	49.84	49.84
137	25	95	7.8	10.7	49.84	49.84	49.84	49.84
136	10	65	-5.8	-9.3	49.84	49.84	49.84	49.84
135	25	75	8.	7.	49.84	49.84	49.84	49.84
134	21	75	-3.	7.	49.84	49.84	49.84	49.84
133	30	95	8.8	20.7	49.84	49.84	49.84	49.84
132	14	40	-7.8	-24.3	49.84	49.84	49.84	49.84
131	25	95	5.8	10.7	49.84	49.84	49.84	49.84
130	10	65	-5.8	10.7	49.84	49.84	49.84	49.84
129	25	95	5.8	10.7	49.84	49.84	49.84	49.84
128	20	65	-1.8	-9.3	49.84	49.84	49.84	49.84
127	8	65	-13.8	-9.3	49.84	49.84	49.84	49.84
126	15	65	-8.8	-24.3	49.84	49.84	49.84	49.84
125	20	65	-1.8	-9.3	49.84	49.84	49.84	49.84
124	15	65	-2.8	-9.3	49.84	49.84	49.84	49.84
123	20	65	-1.8	-9.3	49.84	49.84	49.84	49.84
122	15	65	-1.8	-9.3	49.84	49.84	49.84	49.84
121	20	65	-1.8	-9.3	49.84	49.84	49.84	49.84
120	25	95	5.8	10.7	49.84	49.84	49.84	49.84
119	25	95	5.8	10.7	49.84	49.84	49.84	49.84
118	25	95	5.8	10.7	49.84	49.84	49.84	49.84
117	25	95	5.8	10.7	49.84	49.84	49.84	49.84
116	25	95	5.8	10.7	49.84	49.84	49.84	49.84
115	25	95	5.8	10.7	49.84	49.84	49.84	49.84
114	25	95	5.8	10.7	49.84	49.84	49.84	49.84
113	25	95	5.8	10.7	49.84	49.84	49.84	49.84
112	25	95	5.8	10.7	49.84	49.84	49.84	49.84
111	25	95	5.8	10.7	49.84	49.84	49.84	49.84
110	25	95	5.8	10.7	49.84	49.84	49.84	49.84
109	25	95	5.8	10.7	49.84	49.84	49.84	49.84
108	25	95	5.8	10.7	49.84	49.84	49.84	49.84
107	25	95	5.8	10.7	49.84	49.84	49.84	49.84
106	25	95	5.8	10.7	49.84	49.84	49.84	49.84
105	25	95	5.8	10.7	49.84	49.84	49.84	49.84
104	25	95	5.8	10.7	49.84	49.84	49.84	49.84
103	25	95	5.8	10.7	49.84	49.84	49.84	49.84
102	25	95	5.8	10.7	49.84	49.84	49.84	49.84
101	25	95	5.8	10.7	49.84	49.84	49.84	49.84
100	25	95	5.8	10.7	49.84	49.84	49.84	49.84
99	25	95	5.8	10.7	49.84	49.84	49.84	49.84
98	25	95	5.8	10.7	49.84	49.84	49.84	49.84
97	25	95	5.8	10.7	49.84	49.84	49.84	49.84
96	25	95	5.8	10.7	49.84	49.84	49.84	49.84
95	25	95	5.8	10.7	49.84	49.84	49.84	49.84
94	25	95	5.8	10.7	49.84	49.84	49.84	49.84
93	25	95	5.8	10.7	49.84	49.84	49.84	49.84
92	25	95	5.8	10.7	49.84	49.84	49.84	49.84
91	25	95	5.8	10.7	49.84	49.84	49.84	49.84
90	25	95	5.8	10.7	49.84	49.84	49.84	49.84

TABLE II a (1938)

No.	X	Y	x	y	x ²	y ²	xy
191	25	65	3.8	- 9.3	14.44	86.49	- 35.34
192	29	85	7.8	10.7	60.84	114.49	83.46
193	24	85	2.8	10.7	8.41	114.49	29.96
194	19	65	- 2.2	- 9.3	4.84	86.49	20.46
195	19	85	- 2.2	10.7	4.84	114.49	- 23.54
196	29	85	7.8	10.7	60.84	114.49	83.46
197	19	75	- 2.2	.7	4.84	.49	- 1.54
198	9	40	-12.2	-34.3	1.44	1176.49	418.46
199	16	75	- 5.2	.7	27.04	.49	- 3.64
200	17	65	- 4.2	- 9.3	17.64	86.49	39.06
201	28	85	6.8	10.7	46.24	114.49	72.76
202	25	95	3.8	20.7	14.44	428.49	78.66
203	25	95	3.8	20.7	14.44	428.49	78.66
204	19	65	- 2.2	- 9.3	4.84	86.49	20.46
205	30	85	8.8	10.7	77.44	114.49	94.16
206	22	85	.8	10.7	.64	114.49	8.56
207	--	--	---	---	---	---	---
208	26	75	4.8	.7	23.04	.49	3.36
209	21	65	- .2	- 9.3	.04	86.49	1.96
210	31	95	9.8	20.7	96.04	428.49	202.86
211	21	65	- .2	- 9.3	.04	86.49	1.86
212	27	85	5.8	10.7	33.64	114.49	62.06
213	15	75	- 6.2	.7	38.44	.49	- 4.34
214	24	65	2.8	- 9.3	7.84	86.49	- 26.04
215	10	65	-11.2	- 9.3	125.44	86.49	104.16
216	24	75	2.8	.7	7.84	.49	1.96
217	28	95	6.8	20.7	46.24	428.49	140.76
218	22	75	.8	.7	.64	.49	.56
219	22	65	.8	- 9.3	.64	86.49	- 7.44
220	13	65	- 8.2	- 9.3	67.24	86.49	76.26
221	13	75	- 8.2	.7	67.24	.49	- 5.74
222	22	65	.8	- 9.3	.64	86.49	- 7.44
223	19	75	- 2.2	.7	4.84	.49	- 1.54
224	17	65	- 4.2	- 9.3	17.64	86.49	39.06
225	27	65	5.8	- 9.3	33.64	86.49	- 53.94
226	30	85	8.8	10.7	77.44	114.49	94.16
227	7	50	-14.2	-24.3	201.64	590.49	345.06
228	16	50	- 5.2	-24.3	27.04	590.49	126.36
229	32	85	10.8	10.7	116.64	114.49	115.56
230	29	95	7.8	20.7	60.84	428.49	161.46
231	27	85	5.8	10.7	33.64	114.49	62.06
232	30	75	8.8	.7	77.44	.49	6.16
233	24	65	2.8	- 9.3	7.84	86.49	- 26.04
234	6	40	15.2	34.3	231.04	1176.49	521.36
235	22	85	.8	10.7	.64	114.49	8.56
236	25	75	3.8	.7	14.44	.49	2.66
237	13	50	- 8.2	-24.3	67.24	590.49	199.26
238	18	50	- 3.2	-24.3	10.24	590.49	77.76

TABLE 11 a (1936)

No.	Y	X	Y	X	Y	X
191	35	8.8	- 9.5	16.44	38.43	- 33.34
192	39	8.8	10.7	30.04	114.43	33.43
193	34	8.8	10.7	8.41	114.43	33.33
194	19	- 3.3	- 9.5	4.84	38.43	30.43
195	19	- 3.3	10.7	4.84	114.43	- 33.34
196	39	8.8	10.7	30.04	114.43	33.43
197	19	- 3.3	7.	4.84	.43	- 1.34
198	9	-13.3	-24.3	1.44	119.43	416.43
199	18	- 3.3	7.	37.04	.43	- 3.34
200	17	- 4.3	- 9.5	17.04	38.43	39.03
201	38	8.8	10.7	48.34	114.43	73.73
202	36	8.8	30.7	14.44	438.43	78.03
203	35	8.8	30.7	16.44	438.43	78.03
204	19	- 3.3	- 9.5	4.84	38.43	30.43
205	30	8.8	10.7	77.44	114.43	94.13
206	32	8.	10.7	.84	114.43	8.33
207	--	--	--	--	--	--
208	35	4.8	7.	33.04	.43	3.33
209	31	- 3.	- 9.5	.04	38.43	1.33
210	31	9.8	30.7	95.04	438.43	303.83
211	31	- 3.	- 9.5	.04	38.43	1.33
212	37	8.8	10.7	33.04	114.43	33.03
213	18	- 6.3	7.	38.44	.43	- 4.34
214	34	8.8	- 9.5	7.84	38.43	- 33.04
215	10	-11.3	- 9.5	133.44	38.43	104.13
216	34	8.8	7.	7.84	.43	1.33
217	38	8.8	30.7	48.34	438.43	140.73
218	33	8.	7.	.84	.43	.33
219	33	- 9.5	- 9.5	.04	38.43	- 7.44
220	13	- 8.3	- 9.5	67.34	38.43	73.33
221	13	- 8.3	7.	67.34	.43	- 3.74
222	33	- 9.5	- 9.5	.84	38.43	- 7.44
223	19	- 8.3	7.	4.84	.43	- 1.34
224	17	- 4.3	- 9.5	17.04	38.43	39.03
225	37	8.8	- 9.5	33.04	38.43	- 33.34
226	30	8.8	10.7	77.44	114.43	94.13
227	7	-14.3	-24.3	301.64	330.43	343.03
228	16	- 3.3	-24.3	37.04	330.43	133.33
229	33	10.8	10.7	116.64	114.43	113.33
230	39	7.8	30.7	60.84	438.43	161.43
231	37	8.8	10.7	33.04	114.43	33.03
232	30	8.8	7.	77.44	.43	3.13
233	34	8.8	- 9.5	7.84	38.43	- 33.04
234	40	13.3	34.3	331.04	119.43	331.33
235	33	8.	10.7	.84	114.43	8.33
236	33	3.8	7.	14.44	.43	3.33
237	13	- 8.3	-24.3	37.34	330.43	133.33
238	18	- 3.3	-24.3	10.84	330.43	77.73

TABLE III a (1938)

No.	X	Y	x	y	x ²	y ²	xy
239	17	75	- 4.2	.7	17.64	.49	- 2.94
228	4,839	17,040			10,992.64	47,299.72	16,705.58

21.22 74.3

Correlating;

$$r = \frac{\sum xy}{\sqrt{\sum x^2} \times \sqrt{\sum y^2}} = \frac{16,705.58}{\sqrt{10,992.64} \times \sqrt{47,299.72}}$$

$$= \frac{16705.58}{104.84 \times 217.50} = \frac{16705.58}{22802.70}$$

$$= .732$$

$$P. E. = \frac{.6745 \times (1-r^2)}{\sqrt{N}}$$

$$= \frac{.6745 \times (1-.536)}{\sqrt{228}}$$

$$= \frac{.6745 \times .464}{15.1}$$

$$= \frac{.3129}{15.1} = .0207$$

TABLE 11.4 (1938)

838	17	75	839	17	75	840	17	75	841	17	75
838	17	75	839	17	75	840	17	75	841	17	75
838	17	75	839	17	75	840	17	75	841	17	75

Correlation:

$$r = \frac{\sum xy}{\sqrt{\sum x^2} \sqrt{\sum y^2}} = \frac{16,408.51}{\sqrt{10,998.04} \times \sqrt{17,998.72}}$$

$$= \frac{16,408.51}{104.84 \times 134.30} = .938$$

$$r = \frac{\sum (x - \bar{x})(y - \bar{y})}{\sqrt{\sum (x - \bar{x})^2} \sqrt{\sum (y - \bar{y})^2}} = .938$$

$$= \frac{16,408.51}{104.84 \times 134.30} = .938$$

$$= \frac{16,408.51}{104.84 \times 134.30} = .938$$

$$= \frac{16,408.51}{104.84 \times 134.30} = .938$$

TABLE II b

University of Iowa
Algebra Placement Tests and Algebra Grades

No.	X	Y	x	y	x^2	y^2	xy
37-1	19	65	-16.5	- 9.7	272.25	94.09	162.15
2	33	75	- 2.5	.3	6.25	.09	- .75
3	38	75	2.5	.3	6.25	.09	- .75
4	40	95	4.5	20.3	20.25	412.09	91.35
5	40	75	4.5	.3	20.25	.09	1.35
6	33	85	- 2.5	10.3	6.25	106.09	- 25.75
7	17	50	-18.5	-24.7	342.25	610.09	456.95
8	27	75	- 8.5	.3	72.25	.09	- 2.55
9	27	85	- 8.5	10.3	72.25	106.09	- 87.55
10	21	35	-14.5	-39.7	210.25	1576.69	575.65
11	36	75	.5	.3	.25	.09	.15
12	21	75	-14.5	.3	210.25	.09	- 4.35
13	46	85	10.5	10.3	110.25	106.09	108.15
14	34	65	- 1.5	- 9.7	2.25	94.09	14.55
15	51	85	14.5	10.3	210.25	106.09	149.35
16	25	75	-10.5	.3	110.25	.09	- 3.15
17	45	75	9.5	.3	90.25	.09	2.85
18	30	85	- 5.5	10.3	30.25	106.09	- 56.65
19	29	75	- 6.5	.3	42.25	.09	- 1.95
20	43	65	7.5	- 9.7	56.25	94.09	- 72.75
21	45	95	9.5	20.3	90.25	412.09	192.85
22	50	85	14.5	10.3	210.25	106.09	149.35
23	50	85	14.5	10.3	210.25	106.09	149.35
24	28	65	- 7.5	- 9.7	56.25	94.09	72.75
25	45	75	9.5	.3	90.25	.09	2.85
26	34	85	- 1.5	10.3	2.25	106.09	- 15.45
27	27	50	- 8.5	-24.7	72.25	610.09	209.95
28	35	85	- .5	10.3	.25	106.09	- 5.15
29	26	50	- 9.5	-24.7	90.25	610.09	224.65
30	34	85	- 1.5	10.3	2.25	106.09	- 15.45
31	24	50	-11.5	-24.7	132.25	610.09	284.05
32	34	85	- 1.5	10.3	2.25	106.09	- 15.45
33	18	75	-17.5	.3	306.25	.09	- 5.25
34	59	85	23.5	10.3	552.25	106.09	242.05
35	35	85	- .5	10.3	.25	106.09	- 5.15
36	38	65	2.5	- 9.7	6.25	94.09	- 24.25
37	42	85	6.5	10.3	42.25	106.09	66.95
38	28	65	- 7.5	- 9.7	56.25	94.09	72.75
39	32	75	- 3.5	.3	12.25	.09	- 1.05
40	29	75	- 6.5	.3	42.25	.09	- 1.95
41	29	65	- 6.5	- 9.7	42.25	94.09	63.05
42	38	75	2.5	.3	6.25	.09	.75
43	43	85	7.5	10.3	56.25	106.09	77.25
44	41	85	5.5	10.3	30.25	106.09	56.65

TABLE 11 b
University of Iowa
Algebra Placement Tests and Algebra Grades

No.	X	Y	x	y	X	Y	xy
27-1	19	65	-16.5	-9.7	378.25	94.09	162.12
2	33	75	-2.5	.3	6.25	.09	-.75
3	38	75	2.5	.3	6.25	.09	-.75
4	40	85	4.5	20.3	20.25	412.09	91.35
5	40	75	4.5	.3	20.25	.09	1.35
6	35	85	-6.5	10.3	42.25	106.09	-85.75
7	17	50	-18.5	-24.7	342.25	610.09	456.92
8	27	75	-8.5	.3	72.25	.09	-2.55
9	37	85	-8.5	10.3	72.25	106.09	-87.85
10	31	35	-14.5	-39.7	210.25	1576.09	575.65
11	36	75	5	.3	25	.09	.15
12	31	75	-14.5	.3	210.25	.09	-4.35
13	46	85	10.5	10.3	110.25	106.09	108.15
14	34	45	-1.5	-9.7	2.25	94.09	-14.55
15	31	85	14.5	10.3	210.25	106.09	149.35
16	35	75	-10.5	.3	110.25	.09	-3.15
17	45	75	9.5	.3	90.25	.09	2.85
18	30	85	-5.5	10.3	30.25	106.09	-56.65
19	39	75	3.5	.3	12.25	.09	1.35
20	45	65	7.5	-9.7	56.25	94.09	-72.75
21	45	95	9.5	20.3	90.25	412.09	192.85
22	50	85	14.5	10.3	210.25	106.09	149.35
23	50	85	14.5	10.3	210.25	106.09	149.35
24	28	65	-7.5	-9.7	56.25	94.09	-72.75
25	45	75	9.5	.3	90.25	.09	2.85
26	34	85	-1.5	10.3	2.25	106.09	-15.45
27	37	50	-8.5	-24.7	72.25	610.09	209.92
28	35	85	5	10.3	25	106.09	51.15
29	36	50	-9.5	-24.7	90.25	610.09	234.65
30	34	65	-1.5	10.3	2.25	106.09	-15.45
31	34	30	-11.5	-24.7	132.25	610.09	284.05
32	34	85	-1.5	10.3	2.25	106.09	-15.45
33	18	75	-17.5	.3	306.25	.09	-52.35
34	39	65	22.5	10.3	506.25	106.09	242.05
35	35	85	5	10.3	25	106.09	51.15
36	38	65	2.5	-9.7	6.25	94.09	-24.65
37	45	85	9.5	10.3	90.25	106.09	95.35
38	38	65	-7.5	-9.7	56.25	94.09	-72.75
39	35	75	-5.5	.3	30.25	.09	-1.55
40	39	75	5.5	.3	30.25	.09	1.55
41	39	65	5.5	-9.7	30.25	94.09	-52.05
42	38	75	5.5	.3	30.25	.09	1.55
43	45	65	7.5	10.3	56.25	106.09	77.35
44	41	85	3.5	10.3	12.25	106.09	36.65

TABLE II b

No.	X	Y	x	y	x^2	y^2	xy
45	51	85	15.5	10.3	240.25	106.09	159.65
46	36	75	.5	.3	.25	.09	.15
47	31	65	- 4.5	- 9.7	20.25	94.09	43.65
48	27	65	- 8.5	- 9.7	72.25	94.09	82.45
49	41	65	5.5	- 9.7	30.25	94.09	- 53.65
50	23	65	-12.5	- 9.7	156.25	94.09	121.25
51	--	--	----	---	-----	----	----
52	47	95	11.5	20.3	132.25	412.09	233.45
53	16	65	-19.5	- 9.7	380.25	94.09	189.15
54	26	50	- 9.5	-24.7	90.25	610.09	235.95
55	40	65	4.5	- 9.7	20.25	94.09	- 43.65
56	46	95	10.5	20.3	110.25	412.09	213.15
57	35	85	- .5	10.3	.25	106.09	- 5.15
58	32	85	- 3.5	10.3	12.25	106.09	- 36.05
59	42	75	6.5	.3	42.25	.09	1.95
60	21	50	-14.5	-24.7	210.25	610.09	358.15
61	41	85	5.5	10.3	30.25	106.09	56.65
62	56	85	20.5	10.3	420.25	106.09	211.15
63	41	85	5.5	10.3	30.25	106.09	56.65
64	40	85	4.5	10.3	20.25	106.09	46.35
65	--	--	----	---	-----	----	----
66	16	65	-19.5	- 9.7	380.25	94.09	189.15
67	41	95	5.5	20.3	30.25	412.09	111.65
68	48	75	12.5	.3	156.25	.09	3.75
69	50	65	14.5	- 9.7	210.25	94.09	-140.65
70	47	85	11.5	10.3	132.25	106.09	118.45
71	15	50	-20.5	-24.7	420.25	610.09	506.35
72	35	95	- .5	20.3	.25	412.09	- 10.15
73	32	65	- 3.5	- 9.7	12.25	94.09	33.95
74	49	75	13.5	.3	182.25	.09	4.05
75	59	85	23.5	10.3	552.25	106.09	242.05
76	49	75	13.5	.3	182.25	.09	4.05
77	33	65	- 2.5	- 9.7	6.25	94.09	23.25
78	48	75	12.5	.3	156.25	.09	3.75
79	47	75	11.5	.3	132.25	.09	3.45
80	32	65	- 3.5	- 9.7	12.25	94.09	33.95
81	13	65	-22.5	- 9.7	506.25	94.09	218.25
82	19	65	-16.5	- 9.7	272.25	94.09	162.15
83	44	85	8.5	10.3	72.25	106.09	87.55
84	19	65	-16.5	- 9.7	272.25	94.09	162.15
85	41	95	5.5	20.3	30.25	412.09	111.65
86	50	85	14.5	10.3	210.25	106.09	149.35
87	47	95	11.5	20.3	132.25	412.09	233.45
88	20	75	-15.5	.3	240.25	.09	- 4.65
89	28	50	- 7.5	-24.7	56.25	610.09	185.25
90	44	75	8.5	.3	72.25	.09	2.55
91	40	85	4.5	10.3	20.25	106.09	46.35
92	16	35	-19.5	-39.7	380.25	1576.09	774.15

TABLE

II

No.	X	Y	x	y	X ²	Y ²	xy
32	16	32	-19.2	-32.7	380.32	1326.09	1244.16
33	18	32	-17.2	-32.7	295.84	1069.29	1174.16
34	19	32	-16.2	-32.7	262.44	1069.29	1174.16
35	20	32	-14.2	-32.7	201.64	1069.29	1174.16
36	21	32	-12.2	-32.7	148.84	1069.29	1174.16
37	22	32	-10.2	-32.7	104.04	1069.29	1174.16
38	23	32	-8.2	-32.7	67.24	1069.29	1174.16
39	24	32	-6.2	-32.7	38.44	1069.29	1174.16
40	25	32	-4.2	-32.7	17.64	1069.29	1174.16
41	26	32	-2.2	-32.7	4.84	1069.29	1174.16
42	27	32	-0.2	-32.7	0.04	1069.29	1174.16
43	28	32	1.8	-32.7	3.24	1069.29	1174.16
44	29	32	3.8	-32.7	14.44	1069.29	1174.16
45	30	32	5.8	-32.7	33.64	1069.29	1174.16
46	31	32	7.8	-32.7	60.84	1069.29	1174.16
47	32	32	9.8	-32.7	96.04	1069.29	1174.16
48	33	32	11.8	-32.7	139.24	1069.29	1174.16
49	34	32	13.8	-32.7	190.44	1069.29	1174.16
50	35	32	15.8	-32.7	249.64	1069.29	1174.16
51	36	32	17.8	-32.7	316.84	1069.29	1174.16
52	37	32	19.8	-32.7	392.04	1069.29	1174.16
53	38	32	21.8	-32.7	475.24	1069.29	1174.16
54	39	32	23.8	-32.7	566.44	1069.29	1174.16
55	40	32	25.8	-32.7	667.64	1069.29	1174.16
56	41	32	27.8	-32.7	770.84	1069.29	1174.16
57	42	32	29.8	-32.7	887.04	1069.29	1174.16
58	43	32	31.8	-32.7	1016.24	1069.29	1174.16
59	44	32	33.8	-32.7	1159.44	1069.29	1174.16
60	45	32	35.8	-32.7	1286.64	1069.29	1174.16
61	46	32	37.8	-32.7	1428.84	1069.29	1174.16
62	47	32	39.8	-32.7	1586.04	1069.29	1174.16
63	48	32	41.8	-32.7	1759.24	1069.29	1174.16
64	49	32	43.8	-32.7	1948.44	1069.29	1174.16
65	50	32	45.8	-32.7	2153.64	1069.29	1174.16
66	51	32	47.8	-32.7	2375.84	1069.29	1174.16
67	52	32	49.8	-32.7	2615.04	1069.29	1174.16
68	53	32	51.8	-32.7	2872.24	1069.29	1174.16
69	54	32	53.8	-32.7	3147.44	1069.29	1174.16
70	55	32	55.8	-32.7	3440.64	1069.29	1174.16
71	56	32	57.8	-32.7	3752.84	1069.29	1174.16
72	57	32	59.8	-32.7	4084.04	1069.29	1174.16
73	58	32	61.8	-32.7	4435.24	1069.29	1174.16
74	59	32	63.8	-32.7	4806.44	1069.29	1174.16
75	60	32	65.8	-32.7	5197.64	1069.29	1174.16
76	61	32	67.8	-32.7	5608.84	1069.29	1174.16
77	62	32	69.8	-32.7	6040.04	1069.29	1174.16
78	63	32	71.8	-32.7	6491.24	1069.29	1174.16
79	64	32	73.8	-32.7	6962.44	1069.29	1174.16
80	65	32	75.8	-32.7	7453.64	1069.29	1174.16
81	66	32	77.8	-32.7	7964.84	1069.29	1174.16
82	67	32	79.8	-32.7	8496.04	1069.29	1174.16
83	68	32	81.8	-32.7	9047.24	1069.29	1174.16
84	69	32	83.8	-32.7	9618.44	1069.29	1174.16
85	70	32	85.8	-32.7	10209.64	1069.29	1174.16
86	71	32	87.8	-32.7	10820.84	1069.29	1174.16
87	72	32	89.8	-32.7	11452.04	1069.29	1174.16
88	73	32	91.8	-32.7	12103.24	1069.29	1174.16
89	74	32	93.8	-32.7	12774.44	1069.29	1174.16
90	75	32	95.8	-32.7	13465.64	1069.29	1174.16
91	76	32	97.8	-32.7	14176.84	1069.29	1174.16
92	77	32	99.8	-32.7	14908.04	1069.29	1174.16
93	78	32	101.8	-32.7	15669.24	1069.29	1174.16
94	79	32	103.8	-32.7	16450.44	1069.29	1174.16
95	80	32	105.8	-32.7	17251.64	1069.29	1174.16
96	81	32	107.8	-32.7	18072.84	1069.29	1174.16
97	82	32	109.8	-32.7	18914.04	1069.29	1174.16
98	83	32	111.8	-32.7	19775.24	1069.29	1174.16
99	84	32	113.8	-32.7	20656.44	1069.29	1174.16
100	85	32	115.8	-32.7	21557.64	1069.29	1174.16

TABLE II b

No.	X	Y	x	y	x^2	y^2	xy
93	22	85	-13.5	10.3	182.25	106.09	-139.05
94	22	65	-13.5	- 9.7	182.25	94.09	130.95
95	41	95	5.5	20.3	30.25	412.09	111.65
96	28	75	- 8.5	.3	72.25	.09	- 2.55
97	22	65	-13.5	- 9.7	182.25	94.09	130.95
98 ³⁵	35	85	- .5	10.3	.25	106.09	- 5.15
99	32	75	- 3.5	.3	12.25	.09	- 1.05
100	36	95	.5	20.3	.25	412.09	10.15
101	25	75	- 9.5	.3	90.25	.09	- 2.85
102	43	85	7.5	10.3	56.25	106.09	77.25
103	22	95	-13.5	20.3	182.25	412.09	-274.05
104	47	75	11.5	.3	132.25	.09	3.45
105	38	85	2.5	10.3	6.25	106.09	25.75
106	24	85	-11.5	10.3	132.25	106.09	-118.45
107	23	65	-12.5	- 9.7	156.25	94.09	121.25
108	40	95	4.5	20.3	20.25	412.09	91.35
109	34	65	- 1.5	- 9.7	2.25	94.09	14.55
110	28	65	- 7.5	- 9.7	56.25	94.09	72.75
111	43	85	7.5	10.3	56.25	106.09	77.25
112	34	75	- 1.5	.3	2.25	.09	- .45
113	48	65	12.5	- 9.7	156.25	94.09	121.25
114	49	95	13.5	20.3	182.25	412.09	274.05
115	46	85	10.5	10.3	110.25	106.09	108.15
116	44	75	8.5	.3	72.25	.09	2.55
117	31	65	- 4.5	- 9.7	20.25	94.09	43.65
118	49	50	13.5	-24.7	182.25	610.09	-333.45
119	42	95	6.5	20.3	42.25	412.09	131.95
120	32	75	- 3.5	.3	12.25	.09	- 1.05
121	38	65	2.5	- 9.7	6.25	94.09	- 24.25
122	13	35	-22.5	-39.7	506.25	1576.09	893.25
123	44	75	8.5	.3	72.25	.09	2.55
124	28	85	- 7.5	10.3	56.25	106.09	- 77.25
125	42	65	6.5	- 9.7	42.25	94.09	- 63.05
126	35	85	- .5	10.3	.25	106.09	- 5.15
127	56	85	20.5	10.3	420.25	106.09	211.15
128	39	85	3.5	10.3	12.25	106.09	36.05
129	48	85	12.5	10.3	156.25	106.09	128.75
130	39	85	3.5	10.3	12.25	106.09	36.05
131	21	50	-14.5	-24.7	210.25	610.09	358.15
132	55	95	20.5	20.3	420.25	412.09	416.15
133	27	65	- 8.5	- 9.7	72.25	94.09	82.45
134	45	75	10.5	.3	110.25	.09	3.15
135	31	85	- 4.5	10.3	20.25	106.09	46.35
136	39	95	3.5	20.3	12.25	412.09	71.05
137	24	50	-11.5	-24.7	132.25	610.09	284.05
138	27	65	- 8.5	- 9.7	72.25	94.09	82.45
139	28	85	- 7.5	10.3	56.25	106.09	- 77.25
140	29	65	- 6.5	- 9.7	42.25	94.09	63.05

TABLE II

No.	X	Y	X	Y	X	Y	X	Y
98	32	32	-15.2	10.3	182.32	100.00	-122.00	30.91
99	32	32	-15.2	9.7	182.32	90.00	-120.92	29.01
100	41	32	2.2	20.3	20.32	90.00	-111.82	11.11
101	32	32	-2.2	2.2	2.32	90.00	-2.22	2.22
102	32	32	-15.2	9.7	182.32	94.00	-120.92	29.01
103	32	32	-2.2	10.3	2.32	100.00	-2.12	2.12
104	32	32	-2.2	2.2	2.32	90.00	-2.12	2.12
105	32	32	-2.2	2.2	2.32	90.00	-2.12	2.12
106	32	32	-2.2	2.2	2.32	90.00	-2.12	2.12
107	32	32	-15.2	9.7	182.32	94.00	-120.92	29.01
108	42	32	7.2	10.3	22.32	100.00	-17.22	27.22
109	32	32	-13.2	20.3	182.32	90.00	-127.00	20.00
110	47	32	11.2	2.2	132.32	90.00	-11.22	11.22
111	32	32	2.2	10.3	2.32	100.00	-2.12	2.12
112	32	32	-11.2	10.3	122.32	100.00	-11.22	11.22
113	32	32	-15.2	9.7	182.32	94.00	-120.92	29.01
114	32	32	-15.2	9.7	182.32	94.00	-120.92	29.01
115	40	32	4.2	20.3	20.32	90.00	-14.22	14.22
116	32	32	-1.2	9.7	2.32	94.00	-1.22	1.22
117	32	32	-7.2	2.2	22.32	94.00	-7.22	7.22
118	32	32	-7.2	2.2	22.32	100.00	-7.22	7.22
119	32	32	-1.2	2.2	2.32	90.00	-1.22	1.22
120	32	32	-1.2	2.2	2.32	90.00	-1.22	1.22
121	32	32	-15.2	9.7	182.32	94.00	-120.92	29.01
122	48	32	12.2	2.2	122.32	94.00	-12.22	12.22
123	32	32	-13.2	20.3	182.32	94.00	-127.00	20.00
124	32	32	-13.2	20.3	182.32	94.00	-127.00	20.00
125	32	32	-13.2	20.3	182.32	94.00	-127.00	20.00
126	32	32	-13.2	20.3	182.32	94.00	-127.00	20.00
127	32	32	-13.2	20.3	182.32	94.00	-127.00	20.00
128	32	32	-13.2	20.3	182.32	94.00	-127.00	20.00
129	32	32	-13.2	20.3	182.32	94.00	-127.00	20.00
130	32	32	-13.2	20.3	182.32	94.00	-127.00	20.00
131	32	32	-13.2	20.3	182.32	94.00	-127.00	20.00
132	32	32	-13.2	20.3	182.32	94.00	-127.00	20.00
133	32	32	-13.2	20.3	182.32	94.00	-127.00	20.00
134	32	32	-13.2	20.3	182.32	94.00	-127.00	20.00
135	32	32	-13.2	20.3	182.32	94.00	-127.00	20.00
136	32	32	-13.2	20.3	182.32	94.00	-127.00	20.00
137	32	32	-13.2	20.3	182.32	94.00	-127.00	20.00
138	32	32	-13.2	20.3	182.32	94.00	-127.00	20.00
139	32	32	-13.2	20.3	182.32	94.00	-127.00	20.00
140	32	32	-13.2	20.3	182.32	94.00	-127.00	20.00

TABLE II b

NO.	X	Y	x	y	x ²	y ²	xy
141	33	75	- 2.5	10.3	6.25	106.09	- 25.75
142	39	65	3.5	- 9.7	12.25	94.09	- 33.95
143	37	95	1.5	20.3	2.25	412.09	30.45
144	39	95	3.5	20.3	12.25	412.09	71.05
145	43	85	7.5	10.3	56.25	106.09	77.25
146	54	85	18.5	10.3	342.25	106.09	190.55
147	32	75	- 3.5	.3	12.25	.09	- 1.05
148	34	65	- 1.5	- 9.7	2.25	94.09	14.55
149	22	75	-13.5	.3	182.25	.09	4.05
150	--	--	---	---	----	----	----
151	60	75	24.5	.3	600.25	.09	7.35
152	43	75	7.5	.3	56.25	.09	2.25
153	35	85	- .5	10.3	.25	106.09	- 5.15
154	47	85	11.5	10.3	132.25	106.09	118.45
155	37	75	1.5	.3	2.25	.09	.45
156	38	85	2.5	10.3	6.25	106.09	25.75
157	49	75	13.5	.3	182.25	.09	4.05
158	24	75	-11.5	.3	132.25	.09	- 3.45
159	43	75	7.5	.3	56.25	.09	2.25
160	27	75	- 8.5	.3	72.25	.09	- 2.55
161	41	85	5.5	10.3	30.25	106.09	56.65
162	38	75	2.5	.3	6.25	.09	.75
163	37	75	1.5	.3	2.25	.09	.45
164	27	50	- 8.5	-24.7	72.25	610.09	209.95
165	25	50	-10.5	-24.7	110.25	610.09	259.35
166	42	75	6.5	.3	42.25	.09	1.95
167	12	50	-23.5	-24.7	552.25	610.09	580.45
168	61	95	25.5	20.3	650.25	412.09	517.65
169	29	75	- 6.5	.3	42.25	.09	- 1.95
170	35	85	- .5	10.3	.25	106.09	- 5.15
171	32	85	- 3.5	10.3	12.25	106.09	- 36.05
172	43	95	7.5	20.3	56.25	412.09	152.25
173	15	65	-20.5	- 9.7	420.25	94.09	198.85
174	36	75	1.5	.3	2.25	.09	.45
175	54	85	18.5	10.3	342.25	106.09	190.55
176	45	65	9.5	- 9.7	90.25	94.09	- 92.15
177	63	85	27.5	10.3	756.25	106.09	283.25
178	30	65	- 5.5	- 9.7	30.25	94.09	53.35
179	50	85	14.5	10.3	210.25	106.09	149.35
180	31	85	- 4.5	10.3	20.25	106.09	- 46.35
181	37	85	1.5	10.3	2.25	106.09	15.45
182	42	85	6.5	10.3	42.25	106.09	66.95
183	48	75	12.5	.3	156.25	.09	3.75
184	39	65	3.5	- 9.7	12.25	94.09	- 33.95
185	33	85	- 2.5	10.3	6.25	106.09	- 25.75
186	34	75	- 1.5	.3	2.25	.09	- .45
187	55	85	19.5	10.3	380.25	106.09	200.85
188	46	85	10.5	10.3	110.25	106.09	108.15

TABLE II p

NO.	X	Y	X	Y	X	Y	X ²	Y ²
141	35	75	- 8.5	3	8.5	6.85	108.09	1.75
142	39	65	- 3.5	- 9.7	3.5	18.35	84.09	- 35.95
143	37	95	1.5	80.3	1.5	8.35	418.09	30.45
144	39	95	3.5	80.3	3.5	18.35	418.09	71.05
145	43	85	7.5	10.3	7.5	56.35	106.09	77.35
146	54	88	18.5	10.3	18.5	348.35	106.09	180.35
147	35	75	- 8.5	3	8.5	18.35	106.09	- 1.05
148	44	65	- 1.5	- 9.7	1.5	8.35	84.09	14.35
149	35	75	-18.5	3	18.5	188.35	106.09	4.05
150	--	--	--	--	--	--	--	--
151	60	75	24.5	3	24.5	600.35	106.09	7.35
152	45	75	7.5	3	7.5	56.35	106.09	8.35
153	35	85	- 8	10.3	8	35	106.09	- 5.15
154	47	85	11.5	10.3	11.5	138.35	106.09	118.45
155	37	75	1.5	3	1.5	8.35	106.09	4.5
156	38	85	2.5	10.3	2.5	6.35	106.09	85.75
157	49	75	13.5	3	13.5	188.35	106.09	4.05
158	54	75	-11.5	3	11.5	138.35	106.09	- 3.45
159	45	75	7.5	3	7.5	56.35	106.09	8.35
160	37	75	- 8.5	3	8.5	78.35	106.09	- 5.55
161	41	85	2.5	10.3	2.5	30.35	106.09	86.65
162	39	75	3.5	3	3.5	6.35	106.09	7.5
163	37	75	1.5	3	1.5	8.35	106.09	4.5
164	37	80	- 8.5	-24.7	8.5	78.35	610.09	809.95
165	35	80	-10.5	-24.7	10.5	110.35	610.09	829.35
166	45	75	6.5	3	6.5	45.35	106.09	1.95
167	15	80	-23.5	-24.7	23.5	558.35	610.09	380.45
168	61	95	35.5	80.3	35.5	650.35	418.09	617.65
169	39	75	- 6.5	3	6.5	45.35	106.09	- 1.95
170	35	85	- 8	10.3	8	35	106.09	- 5.15
171	35	85	- 8	10.3	8	35	106.09	- 36.05
172	43	85	7.5	80.3	7.5	56.35	418.09	153.35
173	15	65	-20.5	- 9.7	20.5	420.35	84.09	198.85
174	36	75	1.5	3	1.5	8.35	106.09	4.5
175	54	85	18.5	10.3	18.5	348.35	106.09	180.35
176	45	65	9.5	- 9.7	9.5	90.35	84.09	- 32.15
177	65	85	27.5	10.3	27.5	756.35	106.09	883.35
178	30	65	- 8.5	- 9.7	8.5	30.35	84.09	38.35
179	30	85	14.5	10.3	14.5	810.35	106.09	149.35
180	31	85	- 4.5	10.3	4.5	50.35	106.09	- 46.35
181	37	85	1.5	10.3	1.5	8.35	106.09	15.45
182	45	85	6.5	10.3	6.5	45.35	106.09	66.35
183	45	75	18.5	3	18.5	138.35	106.09	3.75
184	39	65	3.5	- 9.7	3.5	18.35	84.09	- 35.95
185	35	85	- 8.5	3	8.5	78.35	106.09	- 85.75
186	34	75	- 1.5	3	1.5	8.35	106.09	4.5
187	35	85	19.5	10.3	19.5	380.35	106.09	800.85
188	45	85	10.5	10.3	10.5	110.35	106.09	108.15

TABLE II b

No.	X	Y	x	y	x ²	y ²	xy
189	44	85	8.5	10.3	72.25	106.09	87.55
190	59	95	23.5	20.3	552.25	412.09	477.05
191	44	85	8.5	10.3	72.25	106.09	87.55
192	21	50	-14.5	-24.7	210.25	610.09	358.15
193	7	50	-28.7	-24.7	812.25	610.09	703.95
194	48	85	12.5	10.3	156.25	106.09	128.75
195	34	75	- 1.5	.3	2.25	.09	- .45
196	31	75	- 4.5	.3	20.25	.09	- 1.35
197	25	65	-10.5	- 9.7	110.25	94.09	101.85
198	36	75	.5	.3	.25	.09	.15
199	38	95	2.5	20.3	6.25	412.09	50.75
200	34	65	- 1.5	- 9.7	2.25	94.09	14.55
201	14	50	-21.5	-24.7	462.25	610.09	531.15
202	39	75	3.5	.3	12.25	.09	1.05
203	37	75	1.5	.3	2.25	.09	.45
204	43	95	7.5	20.3	56.25	412.09	152.25
205	34	85	- 1.5	10.3	2.25	106.09	- 15.45
206	24	65	-11.5	- 9.7	132.25	94.09	111.55
207	46	85	10.5	10.3	110.25	106.09	108.15
208	13	65	-22.5	- 9.7	506.25	94.09	218.25
209	40	95	4.5	20.3	20.25	412.09	91.35
210	37	85	1.5	10.3	2.25	106.09	15.45
211	28	75	- 7.5	.3	56.25	.09	- 2.25
212	36	85	.5	10.3	.25	106.09	5.15
213	46	85	10.5	10.3	110.25	106.09	108.15
214	32	85	- 3.5	10.3	12.25	106.09	- 36.05
215	36	65	.5	- 9.7	.25	94.09	- 4.85
216	34	85	- 1.5	10.3	2.25	106.09	- 15.45
217	15	65	-20.5	- 9.7	420.25	94.09	198.85
218	53	95	17.5	20.3	306.25	412.09	355.25
219	26	65	- 9.5	- 9.7	90.25	94.09	92.15
220	52	85	16.5	10.3	272.25	106.09	169.95
221	36	75	.5	.3	.25	.09	.15
222	35	85	- .5	10.3	.25	106.09	- 5.15
223	24	85	-11.5	10.3	132.25	106.09	-118.45
224	37	65	1.5	- 9.7	2.25	94.09	- 14.55
225	25	85	-10.5	10.3	110.25	106.09	-108.15
226	19	50	-16.5	-24.7	272.25	610.09	407.55
227	48	85	12.5	10.3	156.25	106.09	128.75
228	57	85	21.5	10.3	462.25	106.09	221.45
229	--	--	---	----	----	----	----
230	51	85	15.5	10.3	240.25	106.09	159.65
231	46	50	10.5	-24.7	110.25	610.09	-259.35
232	27	50	- 8.5	-24.7	72.25	610.09	209.95
233	59	75	23.5	.3	552.25	.09	7.05
234	30	85	- 5.5	10.3	30.25	106.09	- 56.65
235	62	85	26.5	10.3	702.25	106.09	272.95
236	45	85	9.5	10.3	90.25	106.09	97.85

TABLE III d

No.	X	Y	x	y	X	Y	xy
189	44	85	8.5	10.3	108.09	158.25	87.25
190	39	85	3.5	80.3	412.09	256.25	417.09
191	44	85	8.5	10.3	108.09	158.25	87.25
192	51	80	-14.5	-84.7	810.09	718.25	538.15
193	7	80	-84.7	-84.7	810.09	718.25	705.95
194	48	85	18.5	10.3	108.09	198.25	188.75
195	34	75	-1.5	3	.09	8.25	-
196	31	75	-4.5	3	.09	80.25	-1.35
197	53	85	-10.5	-9.7	94.09	110.25	101.85
198	56	75	3	3	.09	8.25	1.5
199	58	85	5.5	80.3	412.09	4.85	50.75
200	34	85	-1.5	-9.7	94.09	8.25	14.25
201	14	80	-81.5	-84.7	810.09	718.25	531.15
202	39	75	3.5	3	.09	12.25	1.09
203	37	75	1.5	3	.09	8.25	.45
204	45	85	7.5	80.3	412.09	56.25	158.25
205	34	85	-1.5	10.3	108.09	8.25	-15.45
206	54	85	-11.5	-9.7	94.09	138.25	111.85
207	46	85	10.5	10.3	108.09	110.25	108.15
208	13	85	-83.5	-84.7	84.09	706.25	218.25
209	40	85	4.5	80.3	412.09	80.25	91.25
210	37	85	1.5	10.3	108.09	8.25	15.45
211	58	75	-7.5	3	.09	56.25	-2.85
212	38	85	3	10.3	108.09	8.25	5.15
213	46	85	10.5	10.3	108.09	110.25	108.15
214	55	85	-5.5	10.3	108.09	16.25	-36.09
215	36	85	2	-9.7	94.09	8.25	-4.85
216	34	85	-1.5	10.3	108.09	8.25	-15.45
217	12	85	-80.5	-84.7	94.09	660.25	198.85
218	55	85	17.5	80.3	412.09	306.25	385.85
219	55	85	-9.5	-9.7	94.09	90.25	92.15
220	58	85	16.5	10.3	108.09	275.25	169.95
221	36	75	3	3	.09	8.25	1.5
222	55	85	3	10.3	108.09	8.25	-2.15
223	34	85	-11.5	10.3	108.09	138.25	-118.45
224	37	85	1.5	-9.7	94.09	8.25	-14.25
225	55	85	-10.5	10.3	108.09	110.25	-108.15
226	50	85	-16.5	-84.7	810.09	275.25	407.25
227	48	85	1.5	10.3	108.09	158.25	168.75
228	57	85	81.5	10.3	108.09	665.25	531.45
229	--	--	--	--	--	--	--
230	51	85	12.5	10.3	108.09	360.25	188.55
231	46	80	10.5	-84.7	810.09	110.25	-828.35
232	57	80	-8.5	-84.7	810.09	72.25	509.95
233	58	75	83.5	3	.09	552.25	7.05
234	50	85	-2.5	10.3	108.09	80.25	-56.65
235	63	85	66.5	10.3	108.09	408.25	575.95
236	45	85	9.5	10.3	108.09	80.25	97.85

TABLE II b

No.	X	Y	x	y	x ²	y ²	xy
237	21	65	-14.5	- 9.7	210.25	94.09	140.65
238	36	85	.5	10.3	.25	106.09	5.15
239	42	85	6.5	10.3	42.25	106.09	66.95
240	45	75	9.5	.3	90.25	.09	2.85
241	37	95	1.5	20.3	2.25	412.09	30.45
242	26	65	- 9.5	- 9.7	90.25	94.09	92.15
243	36	95	.5	20.3	.25	412.09	10.15
244	46	85	10.5	10.3	110.25	106.09	108.15
245	25	75	-10.5	.3	110.25	.09	- 3.15
246	60	85	24.5	10.3	600.25	106.09	252.35
247	24	50	-11.5	-24.7	132.25	610.09	284.05
248	43	95	7.5	20.3	56.25	412.09	152.25
249	32	75	- 3.5	.3	12.25	.09	- 1.05
250	31	65	- 4.5	- 9.7	20.25	94.09	43.65
251	23	85	-12.5	10.3	156.25	106.09	-128.75
252	45	95	9.5	20.3	90.25	412.09	192.85
253	38	65	2.5	- 9.7	6.25	94.09	- 24.25
254	46	95	10.5	20.3	110.25	412.09	213.15
255	36	85	.5	10.3	.25	106.09	5.15
256	56	95	20.5	20.3	420.25	412.09	416.15
257	23	35	-12.5	-39.7	156.25	1576.09	496.25
258	46	85	10.5	10.3	110.25	106.09	108.15
259	56	95	20.5	20.3	420.25	412.09	416.15
260	31	85	- 4.5	10.3	20.25	106.09	- 46.35
261	--	--	---	----	----	----	----
262	53	75	17.5	.3	306.25	.09	5.25
263	36	65	.5	- 9.7	.25	94.09	- 4.85
264	38	95	2.5	20.3	6.25	412.09	50.75
265	33	95	- 2.5	20.3	6.25	412.09	- 50.75
266	19	65	-16.5	- 9.7	272.25	94.09	160.05
267	48	75	12.5	.3	156.25	.09	3.75
268	34	65	- 1.5	- 9.7	2.25	94.09	14.55
269	28	75	- 7.5	.3	56.25	.09	- 2.25
270	46	65	10.5	- 9.7	110.25	94.09	-101.85
271	26	75	- 9.5	.3	90.25	.09	- 2.85
272	35	75	- .5	.3	.25	.09	- .15
273	36	85	.5	10.3	.25	106.09	5.15
274	35	75	- .5	.3	.25	.09	- .15
275	19	65	-16.5	- 9.7	272.25	94.09	160.05
276	31	75	- 4.5	.3	20.25	.09	- 1.35
277	52	75	16.5	.3	272.25	.09	4.95
278	28	95	- 7.5	20.3	56.25	412.09	-152.25
279	46	85	10.5	10.3	110.25	106.09	108.15
280	32	75	- 3.5	.3	12.25	.09	- 1.05
281	21	75	-14.5	.3	210.25	.09	- 4.35
282	40	75	4.5	.3	20.25	.09	1.35
283	44	85	8.5	10.3	72.25	106.09	87.55
284	54	95	18.5	20.3	342.25	412.09	375.55
285	36	75	.5	.3	.25	.09	.15

TABLE II

No.	X	Y	X	Y	X	Y	X ₂	Y ₂	X ₃	Y ₃
237	81	65	-14.5	-9.7	210.25	94.09	210.25	94.09	210.25	94.09
238	82	85	5	10.3	25	106.09	25	106.09	25	106.09
239	43	85	6.5	10.3	42.25	106.09	42.25	106.09	42.25	106.09
240	45	75	9.5	3	90.25	9	90.25	9	90.25	9
241	37	95	1.5	20.3	2.25	412.09	2.25	412.09	2.25	412.09
242	86	65	-9.5	-9.7	90.25	94.09	90.25	94.09	90.25	94.09
243	56	95	5	20.3	25	412.09	25	412.09	25	412.09
244	46	65	10.5	10.3	110.25	106.09	110.25	106.09	110.25	106.09
245	82	75	-10.5	3	110.25	9	110.25	9	110.25	9
246	60	85	24.5	10.3	600.25	106.09	600.25	106.09	600.25	106.09
247	84	50	-11.5	-24.7	132.25	610.09	132.25	610.09	132.25	610.09
248	43	95	7.5	20.3	56.25	412.09	56.25	412.09	56.25	412.09
249	32	75	-3.5	3	12.25	9	12.25	9	12.25	9
250	31	65	-4.5	-9.7	20.25	94.09	20.25	94.09	20.25	94.09
251	83	85	-12.5	10.3	156.25	106.09	156.25	106.09	156.25	106.09
252	45	95	9.5	20.3	90.25	412.09	90.25	412.09	90.25	412.09
253	38	65	8.5	-9.7	72.25	94.09	72.25	94.09	72.25	94.09
254	46	95	10.5	20.3	110.25	412.09	110.25	412.09	110.25	412.09
255	36	85	5	10.3	25	106.09	25	106.09	25	106.09
256	56	95	20.5	20.3	420.25	412.09	420.25	412.09	420.25	412.09
257	83	35	-12.5	-39.7	156.25	1276.09	156.25	1276.09	156.25	1276.09
258	46	85	10.5	10.3	110.25	106.09	110.25	106.09	110.25	106.09
259	56	95	20.5	20.3	420.25	412.09	420.25	412.09	420.25	412.09
260	31	85	-4.5	10.3	20.25	106.09	20.25	106.09	20.25	106.09
261	---	---	---	---	---	---	---	---	---	---
262	55	75	17.5	3	306.25	9	306.25	9	306.25	9
263	56	65	5	-9.7	25	94.09	25	94.09	25	94.09
264	38	95	8.5	20.3	72.25	412.09	72.25	412.09	72.25	412.09
265	53	95	-3.5	20.3	12.25	412.09	12.25	412.09	12.25	412.09
266	19	65	-16.5	-9.7	276.25	94.09	276.25	94.09	276.25	94.09
267	48	75	12.5	3	156.25	9	156.25	9	156.25	9
268	34	65	-1.5	-9.7	2.25	94.09	2.25	94.09	2.25	94.09
269	38	75	-7.5	3	56.25	9	56.25	9	56.25	9
270	46	65	10.5	-9.7	110.25	94.09	110.25	94.09	110.25	94.09
271	26	75	-9.5	3	90.25	9	90.25	9	90.25	9
272	35	75	5	3	25	9	25	9	25	9
273	36	85	5	10.3	25	106.09	25	106.09	25	106.09
274	35	75	5	3	25	9	25	9	25	9
275	19	65	-16.5	-9.7	276.25	94.09	276.25	94.09	276.25	94.09
276	31	75	-4.5	3	20.25	9	20.25	9	20.25	9
277	55	75	16.5	3	276.25	9	276.25	9	276.25	9
278	38	95	-7.5	20.3	56.25	412.09	56.25	412.09	56.25	412.09
279	46	85	10.5	10.3	110.25	106.09	110.25	106.09	110.25	106.09
280	35	75	-3.5	3	12.25	9	12.25	9	12.25	9
281	31	75	-14.5	3	210.25	9	210.25	9	210.25	9
282	40	75	4.5	3	20.25	9	20.25	9	20.25	9
283	44	85	8.5	10.3	72.25	106.09	72.25	106.09	72.25	106.09
284	54	95	18.5	20.3	348.25	412.09	348.25	412.09	348.25	412.09
285	36	75	5	3	25	9	25	9	25	9

TABLE II b

No.	X	Y	x	y	x ²	y ²	xy
286	46	75	10.5	.3	110.25	.09	3.15
287	29	85	- 6.5	10.3	42.25	106.09	- 66.95
288	31	75	- 4.5	.3	20.25	.09	- 1.35
289	49	75	3.5	.3	12.25	.09	1.05
290	52	85	6.5	10.3	42.25	106.09	66.95
291	39	85	3.5	10.3	12.25	106.09	36.05
292	39	95	3.5	20.3	12.25	412.09	71.05
293	56	95	20.5	20.3	420.25	412.09	416.15
294	49	75	13.5	.3	182.25	.09	4.05
295	37	75	1.5	.3	2.25	.09	.45
296	52	95	6.5	20.3	42.25	412.09	131.95
297	35	65	- .5	- 9.7	.25	94.09	4.85
298	45	65	9.5	- 9.7	90.25	94.09	- 92.15
299	57	85	21.5	10.3	462.25	106.09	221.45
300	40	95	4.5	20.3	20.25	412.09	91.35
301	22	50	-13.5	-24.7	182.25	610.09	333.45
302	45	85	9.5	10.3	90.25	106.09	97.85
303	46	85	10.5	10.3	110.25	106.09	108.15
304	27	75	- 8.5	.3	72.25	.09	- 2.55
305	32	75	- 3.5	.3	12.25	.09	- 1.05
306	19	75	-16.5	.3	272.25	.09	- 4.95
307	30	50	- 5.5	-24.7	30.25	610.09	135.85
308	41	75	5.5	.3	30.25	.09	1.65
309	15	65	-20.5	- 9.7	420.25	94.09	198.85
310	54	85	18.5	10.3	342.25	106.09	190.55
311	27	65	- 8.5	- 9.7	72.25	94.09	82.45
312	25	75	-10.5	.3	110.25	.09	- 3.15
313	34	65	1.5	- 9.7	2.25	94.09	14.55
314	41	85	5.5	10.3	30.25	106.09	56.65
315	15	50	-20.5	-24.7	420.25	610.09	506.35
316	45	75	9.5	.3	90.25	.09	2.85
317	37	85	1.5	10.3	2.25	106.09	15.45
318	34	35	- 1.5	-39.7	2.25	1576.09	59.55
319	20	50	-15.5	-24.7	240.25	610.09	382.85
320	33	65	- 2.5	- 9.7	6.25	94.09	24.25
321	21	65	-14.5	- 9.7	210.25	94.09	140.65
322	30	75	- 5.5	.3	30.25	.09	- 1.65
323	22	75	-13.5	.3	182.25	.09	- 4.05
324	23	65	-12.5	- 9.7	156.25	94.09	121.25
325	26	65	- 9.5	- 9.7	90.25	94.09	92.15
326	40	50	4.5	-24.7	20.25	610.09	-111.15
327	18	35	-17.5	-39.7	306.25	1576.09	694.75
328	7	35	-28.5	-39.7	812.25	1576.09	1131.45
329	20	35	-15.5	-39.7	240.25	1576.09	615.35
330	9	50	-26.5	-24.7	702.25	610.09	654.55
331	--	--	---	---	---	---	---
332	25	65	-10.5	- 9.7	110.25	94.09	101.85
333	11	35	-24.5	-39.7	600.25	1576.09	972.65
334	25	65	-10.5	- 9.7	110.25	94.09	101.85

TABLE III

No.	X	Y	X	Y	X ²	Y ²	XY
284	25	65	-10.5	-9.7	110.25	94.09	101.85
285	11	35	-8.5	-3.7	60.25	13.69	31.85
286	25	65	-10.5	-9.7	110.25	94.09	101.85
287	35	75	-15.5	-14.5	240.25	210.25	224.75
288	7	35	-8.5	-3.7	60.25	13.69	31.85
289	18	35	-17.5	-3.7	306.25	13.69	64.75
290	30	55	-29.5	-15.5	870.25	240.25	456.75
291	39	65	-38.5	-25.5	1482.25	650.25	987.75
292	39	65	-38.5	-25.5	1482.25	650.25	987.75
293	25	65	-24.5	-15.5	600.25	240.25	360.75
294	45	75	-14.5	-14.5	210.25	210.25	210.25
295	35	75	-24.5	-14.5	600.25	210.25	360.75
296	25	65	-24.5	-15.5	600.25	240.25	360.75
297	35	75	-14.5	-14.5	210.25	210.25	210.25
298	45	65	-24.5	-25.5	600.25	650.25	360.75
299	27	65	-26.5	-15.5	702.25	240.25	417.75
300	40	65	-13.5	-15.5	182.25	240.25	227.75
301	35	50	-18.5	-8.5	342.25	72.25	157.75
302	45	65	-28.5	-15.5	812.25	240.25	457.75
303	45	65	-28.5	-15.5	812.25	240.25	457.75
304	37	75	-26.5	-14.5	702.25	210.25	360.75
305	35	75	-26.5	-14.5	702.25	210.25	360.75
306	19	75	-16.5	-3.5	272.25	12.25	58.75
307	30	50	-25.5	-8.5	650.25	72.25	217.75
308	41	75	-24.5	-14.5	600.25	210.25	360.75
309	15	65	-30.5	-15.5	930.25	240.25	476.75
310	24	65	-18.5	-15.5	342.25	240.25	227.75
311	37	65	-8.5	-15.5	72.25	240.25	108.75
312	35	75	-10.5	-14.5	110.25	210.25	131.75
313	24	65	-1.5	-14.5	2.25	210.25	20.75
314	41	65	-2.5	-15.5	6.25	240.25	31.75
315	15	50	-30.5	-8.5	930.25	72.25	217.75
316	45	75	-28.5	-14.5	812.25	210.25	360.75
317	37	65	-1.5	-14.5	2.25	210.25	20.75
318	34	35	-1.5	-3.7	2.25	13.69	5.69
319	50	50	-15.5	-15.5	240.25	240.25	240.25
320	33	65	-8.5	-15.5	72.25	240.25	108.75
321	37	65	-14.5	-14.5	210.25	210.25	210.25
322	30	75	-25.5	-14.5	650.25	210.25	360.75
323	35	75	-20.5	-15.5	420.25	240.25	360.75
324	35	65	-20.5	-15.5	420.25	240.25	360.75
325	35	65	-20.5	-15.5	420.25	240.25	360.75
326	40	50	-4.5	-8.5	20.25	72.25	34.75
327	18	35	-17.5	-3.7	306.25	13.69	64.75
328	7	35	-28.5	-3.7	812.25	13.69	31.85
329	50	35	-15.5	-3.7	240.25	13.69	58.75
330	30	50	-25.5	-8.5	650.25	72.25	217.75
331	--	--	--	--	--	--	--
332	35	65	-10.5	-9.7	110.25	94.09	101.85
333	11	35	-8.5	-3.7	60.25	13.69	31.85
334	25	65	-10.5	-9.7	110.25	94.09	101.85

TABLE III b

No.	X	Y	x	y	x ²	y ²	xy
335	27	50	- 8.5	-24.7	72.25	610.09	209.95
336	16	50	-19.5	-24.7	380.25	610.09	481.65
337	26	35	- 9.5	-39.7	90.25	1576.09	377.15
338	21	65	-14.5	- 9.7	210.25	94.09	142.59
339	16	35	-19.5	-39.7	380.25	1576.09	774.15
340	18	50	-17.5	-24.7	306.25	610.09	432.25
341	20	65	-15.5	- 9.7	240.25	94.09	150.35
342	30	50	- 5.5	-24.7	30.25	610.09	135.85

336 11,927 25,095 43,842. 69,936.33 33,475.84

35.5 74.69

$$\text{Correlating, } r = \frac{33,475.84}{\sqrt{43,842} \times \sqrt{69,936.33}} = \frac{33,475.84}{264.46 \times 209.4}$$

$$r = \frac{33,475.84}{55,377.92} = 0.604$$

Probable Error

$$\text{P.E.} = \frac{.6745 \times (.635)}{\sqrt{336}} = \frac{.428}{18.33} = .0233$$

TABLE II D

No.	X	Y	x	y	X	Y	xy
335	37	30	-8.5	-84.7	30.35	310.03	303.35
336	18	30	-19.5	-84.7	380.35	310.03	481.35
337	38	35	-9.5	-39.7	30.35	1376.03	377.15
338	31	35	-14.5	-9.7	310.35	34.03	143.35
339	16	35	-19.5	-39.7	380.35	1376.03	774.15
340	18	30	-17.5	-84.7	306.35	310.03	433.35
341	30	35	-15.5	-9.7	340.35	34.03	130.35
342	30	30	-5.5	-84.7	30.35	310.03	133.35
356	11,937	35,093			143,943	63,358.33	33,473.84
	38.5	74.63					

$$\text{Correlation, } r = \frac{33,473.84}{\sqrt{143,943 \times 63,358.33}} = \frac{33,473.84}{95,446 \times 203.4}$$

$$r = \frac{33,473.84}{52,377.95} = 0.604$$

Probable Error

$$P.E. = \frac{.6745 \times (.633)}{\sqrt{336}} = \frac{.428}{18.33} = .0233$$

TABLE II c (1936)

Correlation of Algebra Test Scores and Algebra Final Grades

No.	X	Y	x	y	x ²	y ²	xy
36-1	26	95	3.6	17.7	12.96	313.29	63.72
2	26	95	3.6	17.7	12.96	313.29	63.72
3	17	75	- 5.4	- 2.3	29.16	5.29	12.42
4	27	65	4.6	-12.3	21.16	151.29	- 56.58
5	24	85	1.6	7.7	2.56	59.29	12.32
6	30	85	7.6	7.7	57.76	59.29	58.52
7	28	75	5.6	- 2.3	31.36	5.29	- 12.88
8	28	85	5.6	7.7	31.36	59.29	43.12
9	14	50	- 8.4	-27.3	70.56	745.29	229.32
10	30	85	7.6	7.7	57.76	59.29	58.52
11	24	85	1.6	7.7	2.56	59.29	12.32
12	20	85	- 2.4	7.7	5.76	59.29	- 18.48
13	29	85	6.6	7.7	43.56	59.29	50.82
14	20	75	- 2.4	- 2.3	5.76	5.29	5.52
15	4	85	-18.4	7.7	338.56	59.29	-141.68
16	29	65	6.6	-12.3	43.56	151.29	- 81.18
17	29	85	6.6	7.7	43.56	59.29	50.82
18	27	85	4.6	7.7	21.16	59.29	35.42
19	27	95	4.6	17.7	21.16	313.29	81.42
20	19	65	- 3.4	-12.3	11.56	151.29	41.82
21	29	85	6.6	7.7	43.56	59.29	50.82
22	19	85	- 3.4	7.7	11.56	59.29	- 26.18
23	22	75	- .4	- 2.3	.16	5.29	9.2
24	27	95	4.6	17.7	21.16	313.29	81.42
25	23	85	.6	7.7	.36	59.29	4.62
26	30	95	7.6	17.7	57.76	313.29	134.52
27	24	85	1.6	7.7	2.56	59.29	12.32
28	28	75	5.6	- 2.3	31.36	5.29	- 12.88
29	23	85	.6	7.7	.36	59.29	4.62
30	4	50	-18.4	-27.3	338.56	745.29	502.32
31	26	95	3.6	17.7	12.96	313.29	63.72
32	13	65	- 9.4	-12.3	88.36	151.89	115.62
33	18	75	- 4.4	- 2.3	19.36	5.29	10.12
34	16	75	- 6.4	- 2.3	40.96	5.29	14.72
35	23	65	.6	-12.3	.36	151.29	- 7.38
36	28	85	5.6	7.7	31.36	59.29	43.10
37	20	75	- 2.4	- 2.3	5.76	5.29	5.52
38	27	65	4.6	-12.3	21.16	51.29	- 56.58
39	12	50	-10.4	-27.3	108.16	745.29	283.92
40	19	75	- 3.4	- 2.3	11.56	5.29	7.82
41	12	65	-10.4	-12.3	108.16	151.29	127.92
42	27	85	4.6	7.7	21.16	59.29	35.42
43	31	85	8.6	7.7	73.96	59.29	66.22
44	24	85	1.6	7.7	2.56	59.29	12.32
45	19	75	- 3.4	- 2.3	11.56	5.29	7.82
46	25	85	2.6	7.7	6.76	59.29	20.02
47	32	95	9.6	17.7	92.16	313.29	169.92

TABLE II o (1938)

Correlation of Algebra Test Scores and Algebra Final Grades

No.	X	Y	x	y	X	Y	xy
1-35	35	35	3.5	17.7	313.39	313.39	63.78
2	33	33	3.3	17.7	313.39	313.39	63.78
3	17	17	-3.4	-3.3	5.93	5.93	12.48
4	37	37	4.6	-18.3	151.39	151.39	-56.58
5	34	34	1.6	7.7	8.59	8.59	12.53
6	30	30	7.6	17.7	57.78	57.78	58.53
7	38	38	5.6	-3.3	31.39	31.39	-18.88
8	38	38	5.6	7.7	31.39	31.39	43.19
9	14	14	-8.4	-37.3	70.59	70.59	329.33
10	30	30	7.6	7.7	57.78	57.78	58.53
11	34	34	1.6	7.7	8.59	8.59	12.53
12	30	30	-3.4	7.7	3.78	3.78	-18.48
13	39	39	6.6	7.7	43.59	43.59	60.83
14	30	30	-3.4	-3.3	5.93	5.93	5.93
15	4	4	-18.4	7.7	338.59	338.59	-141.68
16	39	39	6.6	-15.3	43.59	43.59	-81.19
17	39	39	6.6	7.7	43.59	43.59	50.83
18	37	37	4.6	7.7	31.39	31.39	35.48
19	37	37	4.6	17.7	313.39	313.39	81.48
20	19	19	-3.4	-18.3	151.39	151.39	-41.83
21	39	39	6.6	7.7	43.59	43.59	60.83
22	19	19	-3.4	7.7	11.39	11.39	-26.19
23	39	39	6.6	-3.3	5.93	5.93	5.93
24	37	37	4.6	17.7	313.39	313.39	81.48
25	33	33	1.6	7.7	8.59	8.59	4.63
26	30	30	7.6	17.7	57.78	57.78	134.33
27	34	34	1.6	7.7	8.59	8.59	18.58
28	38	38	5.6	-3.3	31.39	31.39	-18.88
29	33	33	1.6	7.7	8.59	8.59	4.63
30	4	4	-18.4	-37.3	70.59	70.59	308.33
31	36	36	3.6	17.7	18.99	18.99	63.78
32	18	18	-9.4	-18.3	151.39	151.39	-118.68
33	18	18	-4.4	-3.3	5.93	5.93	10.18
34	16	16	-8.4	-3.3	40.99	40.99	14.78
35	35	35	3.5	-18.3	151.39	151.39	-7.38
36	38	38	5.6	7.7	31.39	31.39	43.10
37	30	30	-3.4	-3.3	5.93	5.93	5.93
38	37	37	4.6	-18.3	31.39	31.39	-56.58
39	18	18	-10.4	-37.3	108.19	108.19	383.98
40	19	19	-3.4	-3.3	11.39	11.39	7.83
41	18	18	-10.4	-18.3	108.19	108.19	-187.98
42	37	37	4.6	7.7	31.39	31.39	35.48
43	31	31	8.6	7.7	73.99	73.99	66.83
44	34	34	1.6	7.7	8.59	8.59	18.58
45	19	19	-3.4	-3.3	11.39	11.39	7.83
46	35	35	3.5	7.7	8.78	8.78	80.08
47	36	36	3.6	17.7	313.39	313.39	169.88

TABLE II c (1936)

No.	X	Y	x	y	x ²	y ²	xy
48	21	75	- 1.4	- 2.3	1.96	5.29	3.22
49	27	75	4.6	- 2.3	21.16	5.29	-10.58
50	23	85	.6	7.7	.36	59.29	4.62
51	16	75	- 6.4	- 2.3	40.96	5.29	14.72
52	26	85	3.6	7.7	12.96	59.29	27.72
53	30	85	7.6	7.7	57.76	59.29	58.52
54	16	75	- 6.4	- 2.3	40.96	5.29	14.72
55	23	85	.6	7.7	.36	59.29	4.62
56	17	65	- 5.4	-12.3	29.16	151.29	66.42
57	22	75	- .4	- 2.3	.16	5.29	.92
58	27	75	4.6	- 2.3	21.16	5.29	10.58
59	13	65	- 9.4	-12.3	88.36	151.29	115.62
60	27	85	4.6	7.7	21.16	59.29	35.42
61	10	65	-12.4	-12.3	153.76	151.29	152.52
62	15	85	- 7.4	7.7	54.76	59.29	- 56.98
63	32	85	9.6	7.7	92.16	59.29	73.92
64	23	85	.6	7.7	.36	59.29	4.62
65	7	35	-15.4	-42.3	237.16	1789.29	651.42
66	20	85	- 2.4	7.7	5.76	59.29	- 18.48
67	18	85	- 4.4	7.7	19.36	59.29	- 33.88
68	27	85	4.6	7.7	21.16	59.29	35.42
69	12	65	-10.4	-12.3	108.16	151.29	127.92
70	11	75	-11.4	- 2.3	129.96	5.29	26.22
71	19	85	- 3.4	7.7	11.56	59.29	- 26.18
72	28	85	5.6	7.7	31.36	59.29	43.12
73	25	85	2.6	7.7	6.76	59.29	20.02
74	24	95	1.6	17.7	2.56	313.29	28.32
75	23	85	.6	7.7	.36	59.29	4.62
76	17	75	- 5.4	- 2.3	29.16	5.29	12.42
77	28	75	5.6	- 2.3	31.16	5.29	- 12.88
78	29	95	6.6	17.7	43.56	313.29	116.82
79	20	75	- 2.4	- 2.3	5.76	5.29	5.52
80	24	65	1.6	-12.3	2.56	151.29	19.68
81	28	75	5.6	- 2.3	31.16	5.29	- 12.88
82	24	75	1.6	- 2.3	2.56	5.29	- 3.68
83	26	85	3.6	7.7	12.96	59.29	27.72
84	25	85	2.6	7.7	6.76	59.29	20.02
85	18	75	- 4.4	- 2.3	19.36	5.29	10.12
86	17	75	- 5.4	- 2.3	29.16	5.29	12.42
87	30	85	7.6	7.7	57.76	59.29	58.52
88	27	75	4.6	- 2.3	21.16	5.29	- 10.58
89	13	65	- 9.4	-12.3	88.36	151.29	115.62
90	27	85	4.6	7.7	21.16	59.29	35.42
91	18	65	- 4.4	-12.3	19.36	151.29	54.12
92	16	50	- 6.4	-27.3	40.96	745.29	174.72
93	24	85	1.6	7.7	2.56	59.29	12.32
94	23	85	.6	7.7	.36	59.29	4.62
95	32	95	9.6	17.7	92.16	313.29	169.92
96	27	65	4.6	-12.3	21.16	151.29	- 56.58

TABLE 11 c (1936)

Mc	X	Y	X	Y	X	Y	X	Y
48	21	75	-1.4	-3.8	1.98	2.29	3.28	3.28
49	27	75	4.6	-3.2	21.16	2.29	-10.28	2.29
50	23	82	6	7.7	36	29.29	4.22	29.29
51	16	75	-6.4	-3.2	40.96	2.29	14.78	2.29
52	29	82	2.6	7.7	12.96	29.29	27.78	29.29
53	30	82	3.7	7.7	27.78	29.29	28.28	29.29
54	16	75	-6.4	-3.2	40.96	2.29	14.78	2.29
55	23	82	6	7.7	36	29.29	4.22	29.29
56	17	82	-5.4	-12.3	29.16	121.29	66.42	29.29
57	23	75	4	-3.2	16	2.29	9.2	2.29
58	27	75	4.6	-3.2	21.16	2.29	10.28	2.29
59	13	62	-3.4	-12.3	88.36	121.29	112.28	2.29
60	27	82	4.6	7.7	21.16	29.29	32.42	29.29
61	10	62	-12.4	-12.3	152.76	121.29	152.28	2.29
62	12	82	-7.4	7.7	24.76	29.29	-22.28	29.29
63	23	82	6.6	7.7	28.16	29.29	73.28	29.29
64	23	82	6	7.7	36	29.29	4.22	29.29
65	7	32	-12.4	-42.3	237.16	1782.29	251.42	29.29
66	20	82	-3.4	7.7	8.76	29.29	-18.28	29.29
67	18	82	-4.4	7.7	12.96	29.29	-23.28	29.29
68	27	82	4.6	7.7	21.16	29.29	32.42	29.29
69	12	62	-10.4	-12.3	108.16	121.29	127.28	29.29
70	11	75	-11.4	-3.2	129.96	2.29	22.28	2.29
71	12	82	-3.4	7.7	11.96	29.29	-22.28	29.29
72	22	82	2.6	7.7	21.36	29.29	42.12	29.29
73	22	82	2.6	7.7	21.36	29.29	42.12	29.29
74	24	92	1.6	17.7	8.96	212.29	28.28	29.29
75	22	82	2	7.7	36	29.29	4.22	29.29
76	17	75	-5.4	-3.2	29.16	2.29	12.42	2.29
77	28	75	2.6	-3.2	21.16	2.29	-12.28	2.29
78	22	92	6.6	17.7	43.26	212.29	112.28	29.29
79	20	75	-3.4	-3.2	8.76	2.29	8.28	2.29
80	24	62	1.6	-12.3	8.96	121.29	12.28	29.29
81	28	75	2.6	-3.2	21.16	2.29	-12.28	2.29
82	24	75	1.6	-3.2	8.96	2.29	3.28	2.29
83	22	82	2.6	7.7	21.36	29.29	27.78	29.29
84	22	82	2.6	7.7	21.36	29.29	27.78	29.29
85	18	75	-4.4	-3.2	12.96	2.29	10.12	2.29
86	17	75	-5.4	-3.2	29.16	2.29	12.42	2.29
87	30	82	7.6	7.7	27.76	29.29	28.28	29.29
88	27	75	4.6	-3.2	21.16	2.29	-10.28	2.29
89	12	62	-3.4	-12.3	88.36	121.29	112.28	2.29
90	27	82	4.6	7.7	21.16	29.29	32.42	29.29
91	18	62	-4.4	-12.3	12.96	121.29	22.12	2.29
92	16	20	-6.4	-27.3	40.96	742.29	172.78	2.29
93	24	82	1.6	7.7	8.96	29.29	12.28	2.29
94	22	82	2	7.7	36	29.29	4.22	2.29
95	22	92	2.6	17.7	21.36	212.29	122.28	29.29
96	27	62	4.6	-12.3	21.16	121.29	-22.28	29.29

TABLE II c (1936)

No.	X	Y	x	y	x ²	y ²	xy
97	28	85	5.6	7.7	31.16	59.29	43.12
98	29	85	6.6	7.7	43.56	59.29	50.82
99	27	85	4.6	7.7	21.16	59.29	35.42
100	20	65	- 2.4	-12.3	5.76	151.29	29.52
101	30	65	7.6	-12.3	57.76	151.29	- 93.48
102	18	65	- 4.4	-12.3	19.36	151.29	54.12
103	27	85	4.6	7.7	21.16	59.29	35.42
104	11	65	-11.4	-12.3	29.96	151.29	141.36
105	27	65	4.6	-12.3	21.16	151.29	- 56.58
106	22	85	- .4	7.7	.16	59.29	- 3.08
107	25	85	2.6	7.7	6.76	59.29	20.02
108	29	75	6.6	- 2.3	43.56	5.29	- 15.18
109	25	85	2.6	7.7	6.76	59.29	20.02
110	18	75	- 4.4	- 2.3	19.36	5.29	10.12
111	28	75	5.6	- 2.3	31.16	5.29	- 12.88
112	28	75	5.6	- 2.3	31.16	5.29	- 12.88
113	20	85	- 2.4	7.7	5.76	59.29	- 18.48
114	31	95	8.6	17.7	73.96	313.29	152.22
115	31	75	8.6	- 2.3	73.96	5.29	- 19.78
116	30	85	7.6	7.7	57.76	59.29	58.52
117	19	65	- 3.4	-12.3	11.56	151.29	41.82
118	21	65	- 1.4	-12.3	1.96	151.29	17.22
119	15	65	- 7.4	-12.3	54.76	151.29	91.02
120	19	75	- 3.4	- 2.3	11.56	5.29	7.82
121	32	95	9.6	17.7	92.16	313.29	169.92
122	25	75	2.6	- 2.3	6.76	5.29	- 5.98
123	21	75	- 1.4	- 2.3	1.96	5.29	3.22
124	15	65	- 7.4	-12.3	54.76	151.29	91.02
125	29	75	6.6	- 2.3	43.56	5.29	- 15.18
126	24	85	1.6	7.7	2.56	59.29	12.32
127	29	75	6.6	- 2.3	43.56	5.29	- 15.18
128	24	75	1.6	- 2.3	2.56	5.29	- 3.68
129	14	65	- 8.4	-12.3	70.56	151.29	103.32
130	30	85	7.6	7.7	57.76	59.29	58.52
131	30	85	7.6	7.7	57.76	59.29	58.52
132	--	--	---	----	-----	-----	-----
133	23	75	.6	- 2.3	.36	5.29	- 1.38
134	--	--	---	----	-----	-----	-----
135	19	75	- 3.4	- 2.3	11.56	5.29	7.82
136	23	65	.6	-12.3	.36	151.29	- 7.38
137	18	85	- 4.4	7.7	19.36	59.29	- 33.88
138	27	65	4.6	-12.3	21.16	151.29	- 56.58
139	23	85	.6	7.7	.36	59.29	4.62
140	20	95	- 2.4	17.7	5.76	313.29	- 42.48
141	28	95	5.6	17.7	31.16	313.29	99.12
142	15	65	- 7.4	-12.3	54.76	151.29	91.02
143	28	95	5.6	17.7	31.16	313.29	99.12
144	9	75	-13.4	- 2.3	179.56	5.29	30.36
145	25	95	2.6	17.7	6.76	313.29	46.02

TABLE III c (1936)

No.	X	Y	X	Y	X	Y	X	Y
97	38	65	8.6	7.7	31.16	29.39	48.16	
98	39	65	6.6	7.7	43.26	29.39	50.88	
99	37	65	4.6	7.7	31.16	29.39	38.43	
100	30	65	- 3.4	-12.3	5.75	151.39	29.39	
101	30	65	7.6	-12.3	27.76	151.39	- 32.48	
102	18	65	- 4.6	-12.3	12.25	151.39	24.13	
103	37	65	4.6	7.7	31.16	29.39	32.43	
104	11	65	-11.4	-12.3	39.96	151.39	141.36	
105	37	65	4.6	-12.3	31.16	151.39	- 32.28	
106	23	65	.4	7.7	.16	29.39	- 5.08	
107	32	65	6.6	7.7	6.76	29.39	30.06	
108	69	75	6.6	- 3.3	43.26	2.89	- 12.18	
109	32	65	3.6	7.7	6.76	29.39	30.06	
110	18	75	- 4.6	- 3.3	19.36	2.89	10.15	
111	38	75	5.6	- 3.3	31.16	2.89	- 12.58	
112	38	75	5.6	- 3.3	31.16	2.89	- 12.58	
113	30	65	- 3.4	7.7	5.76	29.39	- 18.48	
114	31	65	6.6	17.7	75.96	313.39	132.36	
115	31	75	6.6	- 3.3	75.96	2.89	- 19.78	
116	30	65	7.6	7.7	27.76	29.39	28.26	
117	19	65	- 3.4	-12.3	11.25	151.39	41.85	
118	31	65	- 1.4	-12.3	1.96	151.39	17.32	
119	12	65	- 7.4	-12.3	34.76	151.39	31.03	
120	19	75	- 3.4	- 3.3	11.25	2.89	7.88	
121	32	65	9.6	17.7	92.16	313.39	169.92	
122	32	75	6.6	- 3.3	6.76	2.89	- 5.98	
123	31	75	- 1.4	- 3.3	1.96	2.89	- 5.98	
124	12	65	- 7.4	-12.3	34.76	151.39	31.03	
125	32	75	6.6	- 3.3	43.26	2.89	- 12.18	
126	34	65	1.6	7.7	3.66	29.39	12.35	
127	39	75	6.6	- 3.3	43.26	2.89	- 12.18	
128	34	75	1.6	- 3.3	3.66	2.89	- 3.68	
129	14	65	- 6.4	-12.3	70.56	151.39	103.32	
130	30	65	7.6	7.7	27.76	29.39	28.26	
131	30	65	7.6	7.7	27.76	29.39	28.26	
132	--	--	--	--	--	--	--	
133	32	75	.6	- 3.3	.36	2.89	- 1.38	
134	--	--	--	--	--	--	--	
135	12	75	- 3.4	- 3.3	11.25	2.89	7.88	
136	33	65	.6	-12.3	.36	151.39	- 7.38	
137	18	65	- 4.4	7.7	19.36	29.39	- 22.88	
138	37	65	4.6	-12.3	31.16	151.39	- 26.68	
139	32	65	.6	7.7	.36	29.39	4.62	
140	30	65	- 3.4	17.7	5.76	313.39	- 42.48	
141	38	65	5.6	17.7	31.16	313.39	39.12	
142	12	65	- 7.4	-12.3	34.76	151.39	31.03	
143	38	65	5.6	17.7	31.16	313.39	39.12	
144	9	75	-12.4	- 3.3	179.26	2.89	30.26	
145	32	65	8.6	17.7	8.76	313.39	46.02	

TABLE II c (1936)

NO.	X	Y	x	y	x^2	y^2	xy
146	17	75	- 5.4	- 2.3	29.16	5.29	12.42
147	15	75	- 7.4	- 2.3	54.76	5.29	17.02
148	24	75	1.6	- 2.3	2.56	5.29	- 3.68
149	24	85	1.6	7.7	2.56	59.29	12.32
150	21	65	- 1.4	-12.3	1.96	151.29	17.22
151	27	85	4.6	7.7	21.16	59.29	35.42
152	30	95	7.6	17.7	57.76	313.29	134.52
153	25	85	2.6	7.7	6.76	59.29	20.02
154	18	65	- 4.4	-12.3	19.36	151.29	54.12
155	14	75	- 8.4	- 2.3	70.56	5.29	19.32
156	4	65	-18.4	-12.3	338.56	151.29	349.32
157	24	85	1.6	7.7	2.56	59.29	12.32
158	20	65	- 2.4	-12.3	5.76	151.29	29.52
159	31	75	8.6	- 2.3	73.96	5.29	- 19.78
160	26	85	3.6	7.7	12.96	59.29	27.72
161	21	50	- 1.4	-27.3	1.96	745.29	38.22
162	23	75	.6	- 2.3	.36	5.29	- 1.38
163	29	75	6.6	- 2.3	43.56	5.29	- 15.18
164	28	65	5.6	-12.3	31.16	151.29	- 68.88
165	25	85	2.6	7.7	6.76	59.29	20.02
166	28	85	5.6	7.7	31.16	59.29	43.12
167	22	75	- .4	- 2.3	.16	5.29	.92
168	28	95	5.6	17.7	31.16	313.29	99.12
169	29	95	6.6	17.7	43.56	313.29	116.82
170	29	75	6.6	- 2.3	43.56	5.29	- 15.18
171	13	65	- 9.4	-12.3	88.36	151.29	115.62
172	21	85	- 1.4	7.7	1.96	59.29	- 10.78
173	18	75	- 4.4	- 2.3	19.36	5.29	10.12
174	24	95	1.6	17.7	2.56	313.29	28.32
175	28	95	5.6	17.7	31.16	313.29	99.12
176	20	75	- 2.4	- 2.3	5.76	5.29	5.52
177	23	75	.6	- 2.3	.36	5.29	- 1.38
178	27	95	4.6	17.7	21.16	313.29	81.42
179	21	65	- 1.4	-12.3	1.96	151.29	17.22
180	23	85	.6	7.7	.36	59.29	4.62
181	17	75	- 5.4	- 2.3	29.16	5.29	12.42
182	26	85	3.6	7.7	12.96	59.29	27.72
183	25	75	2.6	- 2.3	6.76	5.29	- 5.98
184	15	75	- 7.4	- 2.3	54.76	5.29	17.02
185	24	85	1.6	7.7	2.56	59.29	12.32
186	26	85	3.6	7.7	12.96	59.29	27.72
187	27	85	4.6	7.7	21.16	59.29	35.42
188	17	75	- 5.4	- 2.3	29.16	5.29	12.42
189	23	75	.6	- 2.3	.36	5.29	- 1.38
190	28	75	5.6	- 2.3	31.16	5.29	- 12.88
191	16	85	- 6.4	7.7	40.96	59.29	- 49.28
192	30	85	7.6	7.7	57.76	59.29	58.52
193	28	85	5.6	7.7	31.16	59.29	43.12
194	10	75	-12.4	- 2.3	153.76	5.29	28.52

TABLE II a (1936)

NO.	X	Y	X	Y	X	Y	X	Y
144	10	75	-18.4	-2.3	123.76	2.23	24.22	24.22
145	28	82	8.6	-2.5	27.76	2.23	24.22	24.22
146	37	75	-2.4	4.6	21.16	2.23	24.22	24.22
147	37	82	4.6	-2.5	21.16	2.23	24.22	24.22
148	17	75	-2.4	2.3	29.16	2.23	24.22	24.22
149	35	82	2.3	-2.5	13.69	2.23	24.22	24.22
150	28	75	8.6	-2.5	27.76	2.23	24.22	24.22
151	16	82	-6.4	2.3	40.96	2.23	24.22	24.22
152	30	75	7.7	-2.5	59.29	2.23	24.22	24.22
153	22	82	2.3	7.7	5.29	2.23	24.22	24.22
154	18	65	-4.4	-18.3	19.36	131.29	31.16	31.16
155	14	75	-8.4	-2.3	70.56	2.23	24.22	24.22
156	4	65	-18.4	-18.3	338.56	131.29	31.16	31.16
157	24	85	1.6	7.7	2.56	59.29	2.23	24.22
158	20	65	-2.4	-18.3	5.76	131.29	31.16	31.16
159	31	75	8.6	-2.3	73.96	2.23	24.22	24.22
160	26	82	2.3	7.7	13.69	59.29	2.23	24.22
161	21	50	-1.4	-27.3	1.96	742.29	1.96	1.96
162	23	75	6	-2.3	36	2.23	24.22	24.22
163	29	75	6.6	-2.3	43.56	2.23	24.22	24.22
164	28	65	2.6	-18.3	31.16	131.29	31.16	31.16
165	22	82	2.6	7.7	6.76	59.29	2.23	24.22
166	28	82	2.6	7.7	6.76	59.29	2.23	24.22
167	28	75	-2.4	-2.3	5.76	2.23	24.22	24.22
168	28	95	2.6	17.7	31.16	313.29	31.16	31.16
169	28	95	2.6	17.7	43.56	313.29	31.16	31.16
170	29	75	6.6	-2.3	43.56	2.23	24.22	24.22
171	15	65	-9.4	-18.3	88.36	131.29	31.16	31.16
172	21	82	-1.4	7.7	1.96	59.29	2.23	24.22
173	18	75	-4.4	-2.3	19.36	2.23	24.22	24.22
174	24	65	1.6	17.7	2.56	313.29	31.16	31.16
175	25	95	2.6	17.7	31.16	313.29	31.16	31.16
176	20	75	-2.4	-2.3	5.76	2.23	24.22	24.22
177	23	75	6	-2.3	36	2.23	24.22	24.22
178	27	95	4.6	17.7	21.16	313.29	31.16	31.16
179	21	65	-1.4	-18.3	1.96	131.29	31.16	31.16
180	23	82	6	7.7	36	59.29	2.23	24.22
181	17	75	-2.4	-2.3	5.76	2.23	24.22	24.22
182	26	82	2.3	7.7	13.69	59.29	2.23	24.22
183	25	75	2.6	-2.3	6.76	2.23	24.22	24.22
184	15	75	-7.4	-2.3	54.76	2.23	24.22	24.22
185	24	82	1.6	7.7	2.56	59.29	2.23	24.22
186	26	82	2.6	7.7	18.96	59.29	2.23	24.22
187	27	82	4.6	7.7	21.16	59.29	2.23	24.22
188	17	75	-2.4	-2.3	5.76	2.23	24.22	24.22
189	25	75	6	-2.3	36	2.23	24.22	24.22
190	28	75	2.6	-2.3	21.16	2.23	24.22	24.22
191	16	82	-6.4	7.7	40.96	59.29	2.23	24.22
192	20	82	7.6	7.7	27.76	59.29	2.23	24.22
193	28	82	2.6	7.7	21.16	59.29	2.23	24.22
194	10	75	-18.4	-2.3	123.76	2.23	24.22	24.22

TABLE II c (1936)

No.	X	Y	x	y	x ²	y ²	xy
195	17	65	- 5.4	-12.3	29.16	151.29	66.42
196	20	65	- 2.4	-12.3	5.76	151.29	29.52
197	31	95	8.6	17.7	73.96	313.29	152.22
198	26	95	3.6	17.7	12.96	313.29	63.72
199	31	85	8.6	7.7	73.96	59.29	66.22
200	6	50	-16.4	27.3	268.96	745.29	-447.72
201	14	75	- 8.4	- 2.3	70.56	5.29	19.32
202	19	75	- 3.4	- 2.3	11.56	5.29	7.82
203	21	85	- 1.4	7.7	1.96	59.29	- 10.78
204	24	85	1.6	7.7	2.56	59.29	12.32
205	28	85	5.6	7.7	31.16	59.29	43.12
206	29	85	6.6	7.7	43.56	59.29	50.82
207	27	85	4.6	7.7	29.16	59.29	35.42
208	26	95	3.6	17.7	21.16	313.29	63.72
209	20	75	- 2.4	- 2.3	5.76	5.29	5.52
210	25	95	2.6	17.7	6.76	313.29	46.02
211	28	75	5.6	- 2.3	31.16	5.29	12.88
212	17	75	- 5.4	- 2.3	29.16	5.29	12.42
213	24	95	1.6	17.7	2.56	313.29	28.32
214	28	75	5.6	- 2.3	31.16	5.29	- 12.88
215	17	75	- 5.4	- 2.3	29.16	5.29	12.42
216	30	85	7.6	7.7	57.76	59.29	58.52
217	15	75	- 7.4	- 2.3	54.76	5.29	17.02
218	27	85	4.6	7.7	29.16	59.29	35.42
219	29	65	6.6	-12.3	43.56	151.29	- 81.18
220	24	85	1.6	7.7	2.56	59.29	12.32
221	13	75	- 9.4	- 2.3	88.36	5.29	21.62
222	13	65	- 9.4	-12.3	88.36	151.29	115.62
223	25	95	2.6	17.7	6.76	313.29	46.02
224	28	75	5.6	- 2.3	31.16	5.29	- 12.88
225	11	65	-11.4	-12.3	129.96	151.29	140.22
226	24	85	1.6	7.7	2.56	59.29	12.32
227	22	65	- .4	-12.3	.16	151.29	4.92
228	27	85	4.6	7.7	29.16	59.29	35.42
229	23	75	.6	- 2.3	.36	5.29	- 1.38
230	19	75	- 3.4	- 2.3	11.56	5.29	7.82
231	30	85	7.6	7.7	57.76	59.29	58.52
232	31	95	8.6	7.7	73.96	59.29	66.22
233	30	85	7.6	7.7	57.76	59.29	58.52
234	19	85	- 3.4	7.7	11.56	59.29	- 26.18
235	28	75	5.6	- 2.3	31.16	5.29	- 12.88
236	23	85	.6	7.7	.36	59.29	4.62
237	18	85	- 4.4	7.7	19.36	59.29	- 33.88
238	31	85	8.6	7.7	43.96	59.29	66.22
239	29	85	6.6	7.7	43.56	59.29	50.82
240	16	75	- 6.4	- 2.3	40.96	5.29	14.72
241	29	85	6.6	7.7	43.56	59.29	50.82
242	27	65	4.6	-12.3	29.16	151.29	- 56.58
243	30	95	7.6	17.7	57.76	313.29	134.52

TABLE II (cont.)

No.	X	Y	X	Y	X	Y	X	Y
843	20	92	7.6	17.7	27.46	313.29	124.28	-
844	27	85	4.6	-12.3	29.16	121.29	26.28	-
845	39	82	6.6	7.7	43.26	29.29	20.82	-
846	31	96	5.6	7.7	43.26	29.29	66.28	-
847	18	85	-4.4	7.7	18.26	29.29	22.28	-
848	25	82	6.6	7.7	43.26	29.29	4.28	-
849	28	75	2.6	-2.3	31.16	2.29	12.88	-
850	19	72	-2.4	-2.3	2.26	2.29	12.88	-
851	31	75	2.6	-2.3	31.16	2.29	12.88	-
852	13	65	-9.4	-12.3	88.26	121.29	112.28	-
853	25	92	6.6	17.7	43.26	313.29	46.08	-
854	28	75	2.6	-2.3	31.16	2.29	12.88	-
855	11	65	-11.4	-12.3	129.26	121.29	140.28	-
856	24	85	1.6	7.7	8.26	29.29	12.28	-
857	28	62	-4.4	-12.3	16.26	121.29	4.28	-
858	27	82	4.6	7.7	69.16	29.29	22.48	-
859	23	72	6.6	-2.3	36.26	2.29	1.28	-
860	19	72	-2.4	-2.3	11.26	2.29	7.82	-
861	30	82	7.6	7.7	57.26	29.29	28.28	-
862	31	92	6.6	7.7	43.26	29.29	66.28	-
863	30	85	7.6	7.7	57.26	29.29	28.28	-
864	19	85	-2.4	7.7	11.26	29.29	26.18	-
865	28	72	2.6	-2.3	31.16	2.29	12.88	-
866	25	82	6.6	7.7	43.26	29.29	4.28	-
867	18	85	-4.4	7.7	18.26	29.29	22.28	-
868	31	96	5.6	7.7	43.26	29.29	66.28	-
869	39	82	6.6	7.7	43.26	29.29	20.82	-
870	15	72	-6.4	-2.3	40.26	2.29	14.72	-
871	39	82	6.6	7.7	43.26	29.29	20.82	-
872	27	85	4.6	-12.3	29.16	121.29	26.28	-
873	20	92	7.6	17.7	27.46	313.29	124.28	-

TABLE II c (1936)

No.	X	Y	x	y	x ²	y ²	xy
244	32	95	9.6	17.7	92.16	313.29	169.92
245	26	95	3.6	17.7	21.16	313.29	40.71
246	23	75	.6	- 2.3	.36	5.29	- 1.38
247	25	85	2.6	7.7	6.76	59.29	20.02
248	25	85	2.6	7.7	6.76	59.29	20.02
249	14	85	- 8.4	7.7	70.56	59.29	- 64.68
250	29	75	6.6	- 2.3	43.56	5.29	- 15.18
251	25	85	2.6	7.7	6.76	59.29	20.02
252	27	75	4.6	- 2.3	29.16	5.29	- 10.58
253	29	95	6.6	17.7	43.56	313.29	116.82
254	26	85	3.6	7.7	21.16	59.29	27.72
255	29	85	6.6	7.7	43.56	59.29	50.82
256	22	75	- .4	- 2.3	.16	5.29	.92
257	27	85	4.6	7.7	29.16	59.29	35.42
258	7	35	-15.4	-42.3	237.16	1789.29	651.42
259	21	75	- 1.4	- 2.3	1.96	5.29	3.22
260	24	75	1.6	- 2.3	2.56	5.29	- 3.68
261	17	75	- 5.4	- 2.3	29.16	5.29	12.42
262	17	50	- 5.4	-27.3	29.16	749.29	147.42
263	9	50	-13.4	-27.3	179.56	749.29	365.82
264	13	35	- 9.4	-42.3	88.36	1789.29	397.62
265	8	50	-14.4	-27.3	207.36	749.29	393.12
266	16	65	- 6.4	-12.3	40.96	151.29	78.72
267	11	50	-11.4	-27.3	129.96	749.29	311.22
268	18	75	- 4.4	2.3	19.36	5.29	- 10.12
269	15	65	- 7.4	-12.3	54.76	151.29	91.02
270	12	50	-10.4	-27.3	108.16	749.29	283.92
271	18	65	- 4.4	-12.3	19.36	151.29	54.12
272	23	65	.6	-12.3	.36	151.29	- 7.38
273	12	35	-10.4	-42.3	108.16	1789.29	439.92
274	11	50	-11.4	-27.3	129.96	749.29	311.22
275	24	85	1.6	7.7	2.56	59.29	12.32
276	25	75	2.6	- 2.3	6.76	5.29	- 5.98
277	12	65	-10.4	-12.3	108.16	151.29	127.92
278	26	75	3.6	- 2.3	21.16	5.29	- 8.28
279	5	35	-17.4	-42.3	302.76	1789.29	736.02
280	13	65	- 9.4	-12.3	88.36	151.29	115.62
281	13	65	- 9.4	-12.3	88.36	151.29	115.62
279	6,255	21,565			11,146.84	41,555.91	13,150.71
	22.4	77.3					

Correlating the two variables:

$$r = \frac{\sum xy}{\sqrt{\sum x^2} \times \sqrt{\sum y^2}} = \frac{13,150.71}{\sqrt{11,146.84} \times \sqrt{41,555.9}} = \frac{13,150.71}{105.6 \times 203.85} = 0.61$$

$$P.E. = \frac{.6745 \times (1-r^2)}{\sqrt{N}} = \frac{.6745 \times .628}{\sqrt{279}} = \frac{.4236}{16.7} = .0254$$

TABLE III c (1958)

No.	X	Y	X	Y	X ²	Y ²	XY
844	38	95	9.6	17.7	92.16	313.29	169.92
845	38	92	9.6	17.7	92.16	313.29	169.71
846	38	78	9.6	-8.3	92.16	68.89	-79.68
847	32	85	9.6	7.7	92.16	59.29	74.08
848	32	85	9.6	7.7	92.16	59.29	80.08
849	14	85	-8.4	7.7	70.56	59.29	-64.68
850	29	75	6.6	-8.3	43.56	68.89	-54.88
851	32	85	9.6	7.7	92.16	59.29	80.08
852	37	75	4.6	-8.3	21.16	68.89	-38.28
853	32	92	9.6	17.7	92.16	313.29	169.71
854	36	85	9.6	7.7	92.16	59.29	80.08
855	39	85	9.6	7.7	92.16	59.29	83.48
856	35	75	4.6	-8.3	21.16	68.89	-38.28
857	27	85	4.6	7.7	21.16	59.29	35.48
858	7	35	-12.4	-48.3	153.76	1789.89	-601.48
859	31	75	-1.4	-8.3	1.96	68.89	-11.78
860	34	75	1.6	-8.3	2.56	68.89	-13.48
861	17	75	-8.4	-8.3	70.56	68.89	68.89
862	17	50	-8.4	-27.3	70.56	745.29	-229.48
863	3	50	-12.4	-27.3	153.76	745.29	-340.88
864	13	35	-9.4	-48.3	88.36	1789.89	-454.68
865	8	50	-14.4	-27.3	207.36	745.29	-394.78
866	16	65	-6.4	-18.3	40.96	334.89	-117.78
867	11	50	-11.4	-27.3	129.96	745.29	-311.88
868	18	75	-4.4	-8.3	19.36	68.89	-36.78
869	19	65	-7.4	-18.3	54.76	334.89	-135.08
870	18	50	-10.4	-27.3	108.16	745.29	-283.98
871	18	65	-6.4	-18.3	40.96	334.89	-117.78
872	23	65	6.6	-18.3	43.56	334.89	-120.78
873	18	35	-10.4	-48.3	108.16	1789.89	-503.98
874	11	50	-11.4	-27.3	129.96	745.29	-311.88
875	24	65	1.6	7.7	2.56	59.29	12.78
876	35	75	9.6	7.7	92.16	59.29	74.08
877	18	65	-6.4	-18.3	40.96	334.89	-117.78
878	36	75	9.6	7.7	92.16	59.29	74.08
879	3	35	-12.4	-48.3	153.76	1789.89	-601.48
880	12	65	-9.4	-18.3	88.36	334.89	-172.68
881	12	65	-9.4	-18.3	88.36	334.89	-172.68

11,146.84 41,555.81 13,150.71

879 6,555.81, 885 82.4 77.2

Correlating the two variables:

$$r = \frac{\sum XY}{\sqrt{\sum X^2 \sum Y^2}} = \frac{13,150.71}{\sqrt{11,146.84 \times 41,555.81}} = 0.81$$

$$P.E. = \frac{1}{r} \sqrt{1-r^2} = \frac{1}{0.81} \sqrt{1-0.81^2} = 0.524$$

TABLE II d (1935)

Correlation of Algebra Placement Test Scores
and Algebra Final Grades

No.	X	Y	x	y	x^2	y^2	xy
35-1	14	65	- 8	-13	64	169	104
2	26	85	4	7	16	49	28
3	23	75	1	- 3	1	9	- 3
4	19	75	- 3	- 3	9	9	9
5	19	85	- 3	7	9	49	- 21
6	32	65	10	-13	100	169	-130
7	23	65	1	-13	1	169	- 13
8	21	85	- 1	7	1	49	- 7
9	25	95	3	17	9	289	51
10	29	85	7	7	49	49	49
11	21	65	- 1	-13	1	169	13
12	27	85	5	7	25	49	35
13	22	85	1	7	1	49	7
14	18	85	- 4	7	16	49	- 28
15	12	75	-10	- 3	100	9	30
16	20	75	- 2	- 3	4	9	6
17	25	85	3	7	9	49	21
18	26	95	4	17	16	289	68
19	31	85	9	7	81	49	63
20	23	75	1	- 3	1	9	- 3
21	31	95	9	17	81	289	156
22	29	75	7	- 3	49	9	- 21
23	24	85	2	7	4	49	14
24	15	50	- 7	-28	49	784	196
25	20	75	- 2	- 3	4	9	6
26	24	95	2	17	4	289	34
27	28	95	6	17	36	289	102
28	32	75	10	- 3	100	9	- 30
29	28	85	6	7	36	49	42
30	27	75	5	- 3	25	9	- 15
31	28	85	6	7	36	49	42
32	23	75	1	- 3	1	9	- 3
33	29	85	7	7	49	49	49
34	24	85	2	7	4	49	14
35	30	85	8	7	64	49	56
36	28	95	6	17	36	289	102
37	17	65	- 5	-13	25	169	65
38	28	85	6	7	36	49	42
39	14	95	- 8	17	64	289	-136
40	12	75	-10	- 3	100	9	30
41	21	65	- 1	-13	1	169	13
42	27	65	5	-13	25	169	- 65
43	15	65	- 7	-13	49	169	91
44	17	65	- 5	-13	25	169	65
45	14	95	- 8	17	64	289	-136
46	20	50	- 2	-28	4	784	56

TABLE II. 4 (1935)

Correlation of Algebra Placement Test Scores
and Algebra Final Grades

No.	X	Y	x	y	X	Y	xy
1-35	14	65	-8	-13	64	169	104
2	86	85	4	7	16	49	88
3	83	75	1	-3	1	9	3
4	19	73	-3	-5	9	9	9
5	19	85	-3	7	9	49	-21
6	52	65	10	-13	100	169	-130
7	53	65	1	-13	1	169	-13
8	81	85	-1	7	1	49	7
9	55	95	3	17	9	289	51
10	59	85	7	7	49	49	49
11	81	65	-1	-13	1	169	13
12	57	85	2	7	25	49	35
13	82	85	1	7	1	49	7
14	18	85	-4	7	16	49	-28
15	18	75	-3	-5	100	9	30
16	80	75	-2	-5	4	9	8
17	55	85	3	7	9	49	21
18	56	95	4	17	16	289	68
19	31	85	9	7	81	49	63
20	53	75	1	-3	1	9	3
21	51	95	9	17	81	289	158
22	59	75	7	-3	49	9	-21
23	84	85	2	7	4	49	14
24	15	50	-7	-28	49	784	-198
25	80	75	-2	-5	4	9	8
26	84	95	2	17	4	289	34
27	58	95	6	17	36	289	103
28	52	75	10	-3	100	9	-30
29	88	95	6	7	36	49	48
30	57	75	2	-3	25	9	-15
31	58	85	6	7	36	49	48
32	55	75	1	-3	1	9	3
33	59	85	7	7	49	49	49
34	84	85	2	7	4	49	14
35	80	85	6	7	64	49	56
36	58	95	6	17	36	289	108
37	17	65	-5	-13	25	169	65
38	58	85	6	7	36	49	48
39	14	95	-8	17	64	289	-136
40	18	75	-10	-3	100	9	30
41	51	65	-1	-13	1	169	13
42	57	65	2	-13	25	169	-25
43	15	65	-7	-13	49	169	91
44	17	65	-5	-13	25	169	65
45	14	95	-8	17	64	289	-138
46	80	50	-2	-28	4	784	58

TABLE II a (1935)

No.	X	Y	x	y	x^2	y^2	xy
47	23	85	1	7	1	49	7
48	30	95	8	17	64	289	136
49	31	75	9	- 3	81	9	- 27
50	25	85	3	7	9	49	21
51	27	85	5	7	25	49	35
52	18	65	- 4	-13	16	169	52
53	25	95	3	17	9	289	51
54	20	65	- 2	-13	4	169	26
55	29	85	7	7	49	49	49
56	25	95	3	17	9	289	51
57	21	85	- 1	7	1	49	- 7
58	19	75	- 3	- 3	9	9	9
59	29	65	7	-13	49	169	- 91
60	21	75	- 1	- 3	1	9	3
61	4	50	-18	-28	324	784	504
62	29	85	7	7	49	49	49
63	11	65	-11	-13	121	169	143
64	27	85	5	7	25	49	35
65	5	50	-17	-28	289	784	476
66	20	85	- 2	7	4	49	- 14
67	22	75	0	- 3	0	9	0
68	31	85	9	7	81	49	63
69	9	65	-13	-13	169	169	169
70	23	75	1	- 3	1	9	- 3
71	13	75	- 9	- 3	81	9	27
72	24	75	2	- 3	4	9	- 6
73	25	85	3	7	9	49	21
74	30	85	8	7	64	49	56
75	22	75	0	- 3	0	9	0
76	13	75	-9	- 3	81	9	27
77	20	85	- 2	7	4	49	- 14
78	20	75	- 2	- 3	4	9	6
79	13	75	- 9	- 3	81	9	27
80	24	75	2	- 3	4	9	- 6
81	16	50	- 6	-28	36	784	168
82	27	85	5	7	25	49	35
83	21	95	- 1	17	1	289	- 17
84	24	85	2	7	4	49	14
85	26	85	4	7	16	49	28
86	30	95	8	17	64	289	136
87	10	50	-12	-28	144	784	336
88	25	95	3	17	9	289	51
89	--	--	--	--	---	---	---
90	22	65	0	-13	0	169	0
91	19	65	- 3	-13	9	169	39
92	26	75	4	- 3	16	9	- 12
93	11	65	-11	-13	121	169	143
94	25	85	3	7	4	49	21
95	26	75	4	- 3	16	9	- 12

TABLE III (1952)

No.	X	Y	X	Y	X	Y	X
47	82	88	1	7	1	48	7
48	80	85	8	17	8	88	331
49	81	78	9	5 -	9	8	27 -
50	82	88	3	7	3	48	81
51	87	88	2	7	2	48	88
52	18	88	- 4	-18	- 4	188	88
53	82	88	8	17	8	88	81
54	80	88	- 2	-18	- 2	188	88
55	88	88	7	7	7	48	88
56	88	88	3	17	3	88	81
57	81	88	- 1	7	- 1	48	7 -
58	19	78	- 3	- 3	- 3	8	8
59	88	88	7	-18	7	188	18 -
60	81	78	- 1	- 3	- 1	8	8
61	4	80	-18	-88	-18	884	804
62	88	88	7	7	7	48	48
63	17	88	-11	-18	-11	181	148
64	87	88	2	7	2	88	88
65	8	80	-17	-88	-17	888	478
66	80	88	- 2	7	- 2	4	18 -
67	88	78	0	- 3	0	0	0
68	81	88	9	7	9	81	88
69	8	88	-18	-18	-18	188	188
70	88	78	- 1	- 3	- 1	8	8 -
71	18	78	- 9	- 3	- 9	81	87
72	84	78	- 3	- 3	- 3	4	8 -
73	88	88	8	7	8	88	81
74	80	88	8	7	8	84	88
75	88	78	- 9	- 3	- 9	81	87
76	18	78	- 9	- 3	- 9	81	87
77	80	88	- 2	7	- 2	4	18 -
78	80	78	- 3	- 3	- 3	4	8
79	18	78	- 9	- 3	- 9	81	87
80	84	78	- 3	- 3	- 3	4	8 -
81	18	80	- 2	-88	- 2	88	188
82	87	88	2	7	2	88	88
83	81	88	- 1	17	- 1	1	17 -
84	84	88	8	7	8	48	14
85	88	88	4	7	4	48	88
86	80	88	8	17	8	84	188
87	10	80	-18	-88	-18	144	388
88	88	88	3	17	3	88	88
89	--	--	--	--	--	--	--
90	88	88	0	-18	0	188	0
91	19	88	- 3	-18	- 3	8	88
92	88	78	- 4	- 3	- 4	8	18 -
93	17	88	-11	-18	-11	181	148
94	88	88	7	7	7	4	81
95	88	78	- 2	- 3	- 2	18	18 -

TABLE II d (1935)

No.	X	Y	x	y	x ²	y ²	xy
96	23	75	1	- 3	1	9	- 3
97	13	65	- 9	-13	81	169	117
98	20	75	- 2	- 3	4	9	6
99	26	85	4	7	16	49	28
100	11	65	-11	-13	121	169	143
101	25	75	3	- 3	9	9	- 9
102	15	50	- 7	-28	49	784	196
103	29	85	7	7	49	49	49
104	25	85	3	7	9	49	21
105	23	65	1	-13	1	169	- 13
106	17	85	- 5	7	25	49	- 35
107	26	85	4	7	16	49	28
108	18	75	- 4	- 3	16	9	12
109	26	85	4	7	16	49	28
110	26	75	4	- 3	16	9	- 12
111	27	75	5	- 3	25	9	- 15
112	25	65	3	-13	9	169	- 39
113	32	65	10	-13	100	169	-130
114	14	85	- 8	7	64	49	- 56
115	28	95	6	17	36	289	102
116	24	75	2	- 3	4	9	- 6
117	25	75	3	- 3	9	9	- 9
118	8	85	-14	7	196	49	- 98
119	24	75	2	- 3	4	9	- 6
120	29	85	7	7	49	49	49
121	30	95	8	17	64	289	136
122	18	85	- 4	7	16	49	- 28
123	18	65	- 4	-13	16	169	52
124	15	85	- 7	7	49	49	- 49
125	20	85	- 2	7	4	49	- 14
126	23	75	1	- 3	1	9	- 3
127	10	75	-12	- 3	144	9	36
128	27	85	5	7	25	49	35
129	29	95	7	17	49	289	119
130	25	75	3	- 3	9	9	- 9
131	32	85	10	7	100	49	70
132	21	75	- 1	- 3	1	9	3
133	21	75	- 1	- 3	1	9	3
134	26	75	4	- 3	16	9	- 12
135	28	95	6	17	36	289	102
136	28	85	6	7	36	49	42
137	21	65	- 1	-13	1	169	13
138	15	65	- 7	-13	49	169	91
139	25	85	3	7	9	49	21
140	23	85	1	7	1	49	7
141	24	95	2	17	4	289	34
142	11	65	-11	-13	121	169	143
143	28	85	6	7	36	49	42
144	18	75	- 4	- 3	16	9	12

TABLE VII (1988)

No.	X	Y	X	Y	X	Y	X	Y
96	32	72	1	-	3	-	9	-
97	12	62	-	9	-	12	117	
98	30	72	-	2	-	4	2	
99	28	82	4	7	16	28	28	
100	11	62	-	11	-	121	142	
101	22	72	2	-	2	-	2	
102	12	20	-	7	-	42	196	
103	22	62	7	7	42	42	42	
104	22	62	2	7	2	42	21	
105	22	62	1	-	1	-	12	
106	17	62	-	2	-	22	-	
107	22	62	4	7	16	42	28	
108	18	72	-	4	-	2	12	
109	22	62	4	7	16	42	28	
110	22	72	4	-	16	-	12	
111	27	72	2	-	22	-	12	
112	22	62	2	-	2	-	22	
113	22	62	10	-	100	-	120	
114	14	62	-	2	-	22	22	
115	22	62	2	17	32	22	102	
116	24	72	2	-	4	-	2	
117	22	72	2	-	2	-	2	
118	8	62	-	14	-	196	22	
119	24	72	2	-	4	-	2	
120	22	62	7	7	42	42	42	
121	30	62	2	17	32	22	122	
122	12	62	-	4	-	16	-	
123	12	62	-	4	-	16	22	
124	12	62	-	7	-	42	22	
125	20	62	-	2	-	2	-	
126	22	72	-	12	-	144	22	
127	27	62	2	7	32	42	22	
128	22	72	2	-	2	-	2	
129	22	62	10	7	100	42	22	
130	22	62	-	1	-	2	2	
131	21	72	-	1	-	2	2	
132	22	62	-	4	-	16	12	
133	22	62	2	17	32	22	102	
134	22	62	2	7	32	42	22	
135	21	62	-	1	-	1	12	
136	22	62	2	-	2	-	22	
137	21	62	-	7	-	42	22	
138	22	62	-	2	-	2	22	
139	22	62	1	7	1	42	22	
140	22	62	2	17	32	22	22	
141	24	62	-	11	-	121	142	
142	11	62	-	2	-	2	22	
143	22	62	2	7	32	42	22	
144	18	62	-	4	-	16	12	

TABLE II a (1935)

No.	X	Y	x	y	x^2	y^2	xy
145	26	95	4	17	16	289	68
146	12	35	-10	-43	100	1849	4430
147	29	85	7	7	49	49	49
148	9	75	-13	-3	169	9	39
149	17	75	-5	-3	25	9	15
150	2	50	-20	-28	400	784	560
151	4	35	-18	-43	324	1849	774
152	19	75	-3	-3	9	9	9
153	29	75	7	-3	49	9	-21
154	27	75	5	-3	25	9	-15
155	8	65	-14	-13	196	169	182
156	16	75	-6	-3	36	9	18
157	31	85	9	7	81	49	63
158	31	85	9	7	81	49	63
159	24	95	2	17	4	289	34
160	15	85	-7	7	49	49	-49
161	16	65	-6	-13	36	169	78
162	15	65	-7	-13	49	169	91
163	27	85	5	7	25	49	35
164	9	75	-13	-3	169	9	39
165	25	85	3	7	9	49	21
166	27	85	5	7	25	49	35
167	23	85	1	7	1	49	7
168	18	75	-4	-3	16	9	12
169	16	85	-6	7	36	49	-42
170	30	95	8	17	64	289	136
171	16	65	-6	-13	36	169	78
172	31	95	9	17	81	289	153
173	25	85	3	7	9	49	21
174	30	85	8	7	64	49	56
175	24	75	2	-3	4	9	-6
176	23	75	1	-3	1	9	-3
177	22	65	0	-13	0	169	0
178	27	85	5	7	25	49	35
179	27	85	5	7	25	49	35
180	29	95	7	17	49	289	119
181	13	50	-9	-28	81	784	252
182	23	85	1	7	1	49	7
183	15	65	-7	-13	49	169	91
184	18	75	-4	-3	16	9	12
185	19	65	-3	-13	9	169	39
186	32	95	10	17	100	289	170
187	32	95	10	17	100	289	170
188	28	85	6	7	36	49	42
189	24	85	2	7	4	49	14
190	20	75	-2	-3	4	9	6
191	16	75	-6	-3	36	9	18
192	20	85	-2	7	4	49	-14
193	21	85	-1	7	1	49	-7

TABLE 11.4 (1935)

No.	X	Y	X	Y	X	Y	X	Y
142	36	35	4	17	16	389	49	1
146	15	32	-10	-43	100	1849	49	49
147	39	35	7	7	42	42	42	42
148	9	75	-12	3	139	9	9	9
149	17	75	3	3	32	9	9	9
150	5	50	-50	-38	400	784	260	260
151	4	32	-18	-43	324	1849	774	774
152	12	75	3	3	9	9	9	9
153	39	75	7	3	49	9	9	9
154	37	75	5	3	32	9	9	9
155	8	35	-14	-13	136	169	169	169
156	16	75	3	3	36	9	9	9
157	31	35	9	7	81	49	63	63
158	31	35	9	7	81	49	63	63
159	34	35	3	17	4	389	34	34
160	15	35	7	7	49	49	49	49
161	16	35	3	-13	36	169	78	78
162	15	35	7	-13	49	169	91	91
163	37	35	3	7	32	49	33	33
164	9	75	-13	3	169	9	39	39
165	32	35	3	7	9	49	31	31
166	37	35	3	7	32	49	32	32
167	32	35	1	7	49	49	7	7
168	18	75	-	3	16	9	15	15
169	16	35	-	7	36	49	43	43
170	30	35	3	17	64	389	136	136
171	16	35	-	-13	36	169	78	78
172	31	35	9	17	81	389	153	153
173	32	35	3	7	9	49	37	37
174	30	35	9	7	64	49	56	56
175	34	75	3	-	4	9	6	6
176	32	75	1	-	1	9	3	3
177	32	35	0	-13	0	169	0	0
178	37	35	3	7	32	49	35	35
179	37	35	3	7	32	49	39	39
180	39	35	7	17	49	389	119	119
181	13	30	-	-38	81	784	353	353
182	33	35	1	7	1	49	7	7
183	15	35	-	-13	49	169	91	91
184	18	75	-	3	16	9	13	13
185	19	35	-	-13	9	169	39	39
186	32	35	10	17	100	389	170	170
187	32	35	10	17	100	389	170	170
188	39	35	3	7	36	49	43	43
189	34	35	3	7	4	49	14	14
190	30	75	-	3	4	9	6	6
191	16	75	-	3	36	9	13	13
192	30	35	-	7	4	49	14	14
193	31	35	-	7	1	49	7	7

TABLE II a (1935)

No.	X	Y	x	y	x ²	y ²	xy
194	30	95	8	17	64	289	136
195	15	75	-7	-3	49	9	21
194	4,277	15,135			8296	27961	9123

22. 78.

The coefficient of correlation:

$$r = \frac{\sum xy}{\sqrt{\sum x^2} \times \sqrt{\sum y^2}} = \frac{9123}{\sqrt{8,296.} \times \sqrt{27,961.}}$$

$$r = \frac{9123}{91.08 \times 167.2} = \frac{9123}{15,228.58} = 0.599$$

$$\text{The Probable Error} = \frac{.6745 \times (1-r^2)}{\sqrt{N}}$$

$$\text{P.E.}_r = \frac{.6745 \times (1-.359)}{\sqrt{194}} = \frac{.432}{13.93}$$

$$\text{P.E.}_r = .0310$$

TABLE III (1935)

No.	X	Y	X	Y	X	Y	xy
194	30	95	64	17	8	8	138
195	18	75	49	-3	-7	-7	131
194 & 195	48	170	113	14	1	1	269

29. 78.

The coefficient of correlation:

$$r = \frac{\sum xy}{\sqrt{\sum x^2} \sqrt{\sum y^2}} = \frac{269}{\sqrt{113} \sqrt{170}} = \frac{269}{13.93} = 0.99$$

The probable error = $\frac{.6745 \times (1-r)}{\sqrt{n}}$

$$P.E. = \frac{.6745 \times (1-.99)}{\sqrt{194}} = \frac{.0067}{13.93} = .0010$$

TABLE III e Class of 1934

Correlation of Algebra Placement Test Scores and
Algebra Final Grades

No.	X	Y	x	y	x^2	y^2	xy
34-1	29	95	6.2	16	38.44	256	99.2
2	23	85	.2	6	.40	36	1.2
3	20	95	- 2.8	16	7.84	256	- 44.8
4	9	75	-13.8	- 4	190.44	16	55.2
5	31	95	8.2	16	67.24	256	131.2
6	28	75	5.2	- 4	27.04	16	- 10.8
7	26	75	3.2	- 4	10.24	16	- 12.8
8	6	65	-16.8	-14	282.24	196	235.2
9	27	75	4.2	- 4	17.64	16	- 16.8
10	20	95	- 2.8	16	7.84	256	- 44.8
11	25	75	2.2	- 4	4.84	16	- 8.8
12	25	85	2.2	6	4.84	36	13.2
13	25	85	2.2	6	4.84	36	13.2
14	27	95	4.2	16	17.64	256	67.2
15	26	85	3.2	6	10.24	36	19.2
16	19	85	- 3.8	6	14.44	36	- 22.8
17	21	75	- 1.8	- 4	3.24	16	7.2
18	22	75	- .8	- 4	.64	16	3.2
19	25	85	2.2	6	4.84	36	13.2
20	19	75	- 3.8	- 4	14.44	16	15.2
21	18	85	- 4.8	6	23.04	36	- 28.8
22	17	75	- 5.8	- 4	33.64	16	23.2
23	28	75	5.2	- 4	27.04	16	- 20.8
24	9	65	-13.8	-14	190.44	196	193.2
25	22	75	- .8	- 4	.64	16	3.2
26	25	75	2.2	- 4	4.84	16	- 8.8
27	14	50	- 8.8	-29	77.44	841	255.2
28	31	95	8.2	16	67.24	256	131.2
29	30	85	7.2	6	51.84	36	43.2
30	28	75	5.2	- 4	27.04	16	- 20.8
31	27	85	4.2	6	17.64	36	25.2
32	15	50	- 7.8	-29	60.84	841	226.2
33	26	85	3.2	6	10.24	36	19.2
34	17	75	- 5.8	- 4	33.64	16	23.2
35	17	75	- 5.8	- 4	33.64	16	23.2
36	27	85	4.2	6	17.64	36	25.2
37	25	85	2.2	6	4.84	36	13.2
38	27	95	4.2	16	17.64	256	67.2
39	21	65	- 1.8	-14	3.24	196	25.2
40	22	65	- .8	-14	.64	196	11.2
41	16	75	- 6.8	- 4	46.24	16	27.2
42	26	75	3.2	- 4	10.24	16	12.8
43	14	65	- 8.8	-14	77.44	196	123.2
44	23	75	.2	- 4	.04	16	.8
45	22	65	- .8	-14	.64	196	11.2
46	30	85	7.2	6	51.84	36	43.2

TABLE II - Class of 1934
Correlation of Algebra Placement Test Scores and
Algebra Final Grades

No.	X	Y	X	Y	X	Y	XY
24-1	89	95	8.9	9.5	16	16	89.3
2	83	85	8.3	8.5	6	6	1.9
3	80	95	-2.8	9.5	16	16	-44.8
4	8	75	-13.8	7.5	-4	-4	55.3
5	31	95	8.3	9.5	16	16	131.3
6	88	75	8.8	7.5	-4	-4	-10.8
7	84	75	8.4	7.5	-4	-4	-13.8
8	8	65	-13.8	6.5	-14	-14	835.3
9	27	75	4.2	7.5	-4	-4	-16.8
10	30	95	-2.8	9.5	16	16	-44.8
11	35	75	3.5	7.5	-4	-4	-8.8
12	35	85	3.5	8.5	6	6	13.3
13	35	85	3.5	8.5	6	6	13.3
14	27	95	4.2	9.5	16	16	67.8
15	85	65	8.5	6.5	6	6	19.3
16	19	85	-3.8	8.5	6	6	-33.8
17	31	75	-1.8	7.5	-4	-4	7.3
18	35	75	3.5	7.5	-4	-4	3.3
19	35	85	3.5	8.5	6	6	19.3
20	19	75	-3.8	7.5	-4	-4	-13.3
21	18	85	-4.8	8.5	6	6	-33.8
22	17	75	-5.8	7.5	-4	-4	-33.3
23	38	75	3.8	7.5	-4	-4	-30.8
24	9	65	-13.8	6.5	-14	-14	193.3
25	33	75	3.3	7.5	-4	-4	3.3
26	35	75	3.5	7.5	-4	-4	-8.8
27	14	50	-8.8	5.0	-38	-38	335.3
28	31	95	8.3	9.5	16	16	131.3
29	30	85	3.0	8.5	6	6	43.3
30	38	75	3.8	7.5	-4	-4	-30.8
31	27	85	4.2	8.5	6	6	33.3
32	13	50	-7.8	5.0	-38	-38	335.3
33	38	85	3.8	8.5	6	6	19.3
34	17	75	-5.8	7.5	-4	-4	-33.3
35	17	75	-5.8	7.5	-4	-4	-33.3
36	27	85	4.2	8.5	6	6	33.3
37	35	85	3.5	8.5	6	6	19.3
38	27	95	4.2	9.5	16	16	67.8
39	31	65	-1.8	6.5	-14	-14	33.3
40	35	65	3.5	6.5	-14	-14	11.3
41	18	75	-6.8	7.5	-4	-4	-37.3
42	38	75	3.8	7.5	-4	-4	-30.8
43	14	65	-8.8	6.5	-14	-14	133.3
44	35	75	3.5	7.5	-4	-4	3.3
45	35	65	3.5	6.5	-14	-14	11.3
46	30	85	3.0	8.5	6	6	43.3

TABLE II e (1934)

No.	X	Y	x	y	x ²	y ²	xy
47	21	75	- 1.8	- 4	3.24	16	7.2
48	21	65	- 1.8	-14	3.24	196	25.2
49	28	85	5.2	6	27.04	36	31.2
50	24	50	1.2	-29	1.44	841	- 34.8
51	30	85	7.2	6	51.84	36	42.2
52	17	75	- 5.8	- 4	33.64	16	23.2
53	18	85	- 4.8	6	23.04	36	- 28.8
54	21	75	- 1.8	- 4	3.24	16	7.2
55	21	85	- 1.8	6	3.24	36	- 10.8
56	29	85	6.2	6	38.44	36	37.2
57	27	85	4.2	6	17.64	36	25.2
58	25	75	2.2	- 4	4.84	16	- 8.8
59	22	85	- .8	6	.64	36	- 4.8
60	27	75	4.2	- 4	17.64	16	-16.8
61	12	50	-10.8	-29	116.64	841	313.2
62	27	85	4.2	6	17.64	36	25.2
63	27	75	4.2	- 4	17.64	16	- 16.8
64	15	75	- 7.8	- 4	60.84	16	31.2
65	22	65	- .8	-14	.64	196	11.2
66	19	50	- 3.8	-29	14.44	841	110.2
67	22	95	- .8	16	.64	256	- 12.8
68	27	85	3.2	6	10.24	36	19.2
69	24	85	1.2	6	1.44	36	7.2
70	26	75	3.2	- 4	10.24	16	- 12.8
71	22	75	- .8	- 4	.64	16	3.2
72	32	85	9.2	6	84.64	36	55.2
73	23	65	.2	-14	.04	196	- 2.8
74	23	85	.2	6	.04	36	1.2
75	31	95	8.2	16	67.24	256	131.2
76	25	85	2.2	6	4.84	36	13.2
77	12	65	-10.8	-14	116.64	196	151.2
78	16	85	- 6.8	6	46.24	36	- 40.8
79	25	85	2.2	6	4.84	36	13.2
80	27	85	4.2	6	17.64	36	25.2
81	12	75	-10.8	- 4	116.64	16	43.2
82	27	85	4.2	6	17.64	36	25.2
83	31	85	8.2	6	67.24	36	49.2
84	17	75	- 5.8	- 4	33.64	16	23.2
85	14	75	- 8.8	- 4	77.44	16	35.2
86	27	85	4.2	6	17.64	36	25.2
87	23	85	.2	6	.04	36	1.2
88	29	95	6.2	16	38.44	256	99.2
89	24	65	1.2	-14	1.44	196	- 16.8
90	23	95	.2	16	.04	256	3.2
91	25	85	2.2	6	4.84	36	13.2
92	26	75	3.2	- 4	10.24	16	- 12.8
93	27	65	4.2	-14	17.64	196	- 58.8
94	25	65	2.2	-14	4.84	196	- 30.8

TABLE II - 11 538.7

No.	X	Y	Z	V	W	X	Y
47	81	78	- 1.8	- 4	48.8	18	8.7
48	81	88	- 1.8	- 18	48.8	180	8.8
49	88	88	8.8	8	47.04	88	8.1
50	88	88	1.8	- 28	1.44	881	8.8 -
51	88	88	7.8	8	81.84	88	8.8
52	17	78	- 8.8	- 4	88.84	18	8.8
53	18	88	- 8.8	8	88.84	88	8.8 -
54	81	78	- 1.8	- 4	8.84	18	8.7
55	81	88	- 1.8	8	8.84	88	8.8 -
56	88	88	8.8	8	88.44	88	8.7
57	88	88	4.8	8	17.84	88	8.8
58	88	78	8.8	- 4	4.84	18	8.8 -
59	88	88	- 8	8	.84	88	8.8 -
60	88	78	8.8	- 4	17.84	18	8.8 -
61	18	88	- 10.8	- 28	118.84	881	8.8
62	88	88	4.8	8	17.84	88	8.8
63	88	78	4.8	- 4	17.84	18	8.8 -
64	18	78	- 7.8	- 4	80.84	18	8.1
65	88	88	- 8	- 18	.84	180	8.1
66	19	88	- 8.8	- 28	14.84	881	8.0
67	88	88	- 8	18	.84	888	8.8 -
68	88	88	8.8	8	10.84	78	8.8
69	88	88	1.8	8	1.44	88	8.7
70	88	78	8.8	- 4	10.84	18	8.8 -
71	88	78	- 8	- 4	.84	18	8.8
72	88	88	8.8	8	84.84	88	8.8
73	88	88	8	- 18	.84	180	8.8 -
74	88	88	8	8	.84	88	8.1
75	81	88	8.8	18	87.84	880	8.8
76	88	88	8.8	8	4.84	88	8.8
77	18	88	- 10.8	- 18	118.84	180	8.8
78	18	88	- 8.8	8	48.84	88	8.8 -
79	88	88	8.8	8	4.84	88	8.1
80	88	88	4.8	8	17.84	88	8.8
81	18	78	- 13.8	- 4	118.84	18	8.8
82	88	88	4.8	8	17.84	88	8.8
83	81	88	8.8	8	87.84	88	8.8
84	17	78	- 8.8	- 4	88.84	18	8.8
85	18	78	- 8.8	- 4	77.84	18	8.8
86	88	88	4.8	8	17.84	88	8.8
87	88	88	8	8	.84	88	8.1
88	88	88	8.8	18	88.44	888	8.8
89	88	88	1.8	- 18	1.44	180	8.8 -
90	88	88	8	18	.84	888	8.8
91	88	88	8.8	8	4.84	88	8.8
92	88	78	8.8	- 4	10.84	18	8.8 -
93	88	88	4.8	- 18	17.84	188	8.8 -
94	88	88	8.8	- 18	4.84	188	8.8 -

TABLE III e (1934)

No.	X	Y	x	y	x ²	y ²	xy
95	24	75	1.2	- 4	1.44	16	- 4.8
96	25	85	2.2	6	4.84	36	13.2
97	25	75	2.2	- 4	4.84	16	- 8.8
98	28	75	5.2	- 4	27.04	16	- 20.8
99	24	75	1.2	- 4	1.44	16	- 4.8
100	30	75	7.2	- 4	51.84	16	- 28.8
101	8	75	-14.8	- 4	219.04	16	59.2
102	32	85	9.2	6	84.64	36	55.2
103	23	85	.2	6	.04	36	1.2
104	14	75	- 8.8	- 4	77.44	16	35.2
105	14	65	- 8.8	-14	77.44	196	123.2
106	14	85	- 8.8	6	77.44	36	- 52.8
107	27	85	4.2	6	17.64	36	25.2
108	18	85	- 4.8	6	23.04	36	- 28.8
109	28	85	5.2	6	27.04	36	31.2
110	27	85	4.2	6	17.64	36	25.2
111	15	65	- 7.8	-14	60.84	196	109.2
112	25	85	2.2	6	4.84	36	13.2
113	22	75	- .8	- 4	.64	16	3.2
114	27	95	4.2	16	17.64	256	67.2
115	28	95	5.2	16	27.04	256	83.2
116	28	75	5.2	- 4	27.04	16	- 20.8
117	24	75	1.2	- 4	1.44	16	- 4.8
118	31	95	8.2	16	67.24	256	131.2
119	26	95	3.2	16	10.24	256	51.2
120	10	85	-12.8	6	163.84	36	- 76.8
121	20	85	- 2.8	6	7.84	36	- 16.8
122	21	85	- 1.8	6	3.24	36	10.8
123	22	95	- .8	16	.64	256	- 12.8
124	18	85	- 4.8	6	23.04	36	- 28.8
125	16	50	- 6.8	-29	46.24	841	197.2
126	27	85	4.2	6	17.64	36	25.2
126	2,869	9,950			4,041.4	14,466.	3,628.

22.8 79.

$$\text{Correlating: } r = \frac{\sum xy}{\sqrt{\sum x^2} \times \sqrt{\sum y^2}} = \frac{3,628}{\sqrt{4,041.4} \times \sqrt{14,466.}}$$

$$r = \frac{3,628}{63.57 \times 120.2} = \frac{3,628}{7,641} = 0.4748$$

$$\text{P.E.}_r = \frac{.6745 \times (1-r^2)}{\sqrt{N}} = \frac{.6745 \times (1-.225)}{\sqrt{126}} = \frac{.523}{11.23}$$

$$\text{P.E.}_r = 0.0466$$

TABLE II (Cont)

No.	X	Y	X	Y	X	Y	X	Y
96	24	75	1.2	-	4	1.44	15	-
97	25	76	2.3	5	4.84	23	13.2	
98	26	77	3.3	-	4	4.84	16	-
99	28	75	3.3	-	4	27.04	15	-
100	24	75	1.2	-	4	1.44	16	-
101	30	75	7.2	-	4	51.84	15	-
102	8	75	-14.8	-	4	219.04	15	-
103	22	85	2.2	5	6	84.64	25	62.2
104	25	85	2.2	5	6	1.06	25	1.2
105	14	75	-5.8	-	4	77.44	15	13.2
106	14	65	-5.8	-14	6	77.44	195	183.2
107	14	85	-5.8	5	6	77.44	25	-
108	27	85	4.2	5	6	17.64	25	21.2
109	18	85	-4.8	5	6	23.04	25	-
110	28	85	5.2	5	6	27.04	25	31.2
111	27	85	4.2	5	6	17.64	25	21.2
112	15	65	-7.8	-14	6	60.84	195	108.2
113	25	85	2.2	5	6	4.84	25	13.2
114	23	75	1.2	-	4	1.44	15	4.2
115	27	95	4.2	15	15	17.64	225	67.2
116	28	95	5.2	15	15	27.04	225	82.2
117	28	75	5.2	-	4	27.04	15	-
118	24	75	1.2	-	4	1.44	15	-
119	21	95	5.2	15	15	27.04	225	131.2
120	25	95	2.2	15	15	10.24	225	51.2
121	10	85	-13.8	5	6	189.84	25	-
122	20	85	-2.8	5	6	7.84	25	-
123	21	85	-1.8	5	6	3.24	25	-
124	23	95	1.2	15	15	1.44	225	-
125	18	85	-4.8	5	6	23.04	25	-
126	15	95	-5.8	-25	6	40.84	841	127.2
127	27	85	4.2	5	6	17.64	25	21.2
128	27	85	4.2	5	6	17.64	25	21.2
129	27	85	4.2	5	6	17.64	25	21.2
130	27	85	4.2	5	6	17.64	25	21.2
131	27	85	4.2	5	6	17.64	25	21.2
132	27	85	4.2	5	6	17.64	25	21.2
133	27	85	4.2	5	6	17.64	25	21.2
134	27	85	4.2	5	6	17.64	25	21.2
135	27	85	4.2	5	6	17.64	25	21.2
136	27	85	4.2	5	6	17.64	25	21.2
137	27	85	4.2	5	6	17.64	25	21.2
138	27	85	4.2	5	6	17.64	25	21.2
139	27	85	4.2	5	6	17.64	25	21.2
140	27	85	4.2	5	6	17.64	25	21.2
141	27	85	4.2	5	6	17.64	25	21.2
142	27	85	4.2	5	6	17.64	25	21.2
143	27	85	4.2	5	6	17.64	25	21.2
144	27	85	4.2	5	6	17.64	25	21.2
145	27	85	4.2	5	6	17.64	25	21.2
146	27	85	4.2	5	6	17.64	25	21.2
147	27	85	4.2	5	6	17.64	25	21.2
148	27	85	4.2	5	6	17.64	25	21.2
149	27	85	4.2	5	6	17.64	25	21.2
150	27	85	4.2	5	6	17.64	25	21.2
151	27	85	4.2	5	6	17.64	25	21.2
152	27	85	4.2	5	6	17.64	25	21.2
153	27	85	4.2	5	6	17.64	25	21.2
154	27	85	4.2	5	6	17.64	25	21.2
155	27	85	4.2	5	6	17.64	25	21.2
156	27	85	4.2	5	6	17.64	25	21.2
157	27	85	4.2	5	6	17.64	25	21.2
158	27	85	4.2	5	6	17.64	25	21.2
159	27	85	4.2	5	6	17.64	25	21.2
160	27	85	4.2	5	6	17.64	25	21.2
161	27	85	4.2	5	6	17.64	25	21.2
162	27	85	4.2	5	6	17.64	25	21.2
163	27	85	4.2	5	6	17.64	25	21.2
164	27	85	4.2	5	6	17.64	25	21.2
165	27	85	4.2	5	6	17.64	25	21.2
166	27	85	4.2	5	6	17.64	25	21.2
167	27	85	4.2	5	6	17.64	25	21.2
168	27	85	4.2	5	6	17.64	25	21.2
169	27	85	4.2	5	6	17.64	25	21.2
170	27	85	4.2	5	6	17.64	25	21.2
171	27	85	4.2	5	6	17.64	25	21.2
172	27	85	4.2	5	6	17.64	25	21.2
173	27	85	4.2	5	6	17.64	25	21.2
174	27	85	4.2	5	6	17.64	25	21.2
175	27	85	4.2	5	6	17.64	25	21.2
176	27	85	4.2	5	6	17.64	25	21.2
177	27	85	4.2	5	6	17.64	25	21.2
178	27	85	4.2	5	6	17.64	25	21.2
179	27	85	4.2	5	6	17.64	25	21.2
180	27	85	4.2	5	6	17.64	25	21.2
181	27	85	4.2	5	6	17.64	25	21.2
182	27	85	4.2	5	6	17.64	25	21.2
183	27	85	4.2	5	6	17.64	25	21.2
184	27	85	4.2	5	6	17.64	25	21.2
185	27	85	4.2	5	6	17.64	25	21.2
186	27	85	4.2	5	6	17.64	25	21.2
187	27	85	4.2	5	6	17.64	25	21.2
188	27	85	4.2	5	6	17.64	25	21.2
189	27	85	4.2	5	6	17.64	25	21.2
190	27	85	4.2	5	6	17.64	25	21.2
191	27	85	4.2	5	6	17.64	25	21.2
192	27	85	4.2	5	6	17.64	25	21.2
193	27	85	4.2	5	6	17.64	25	21.2
194	27	85	4.2	5	6	17.64	25	21.2
195	27	85	4.2	5	6	17.64	25	21.2
196	27	85	4.2	5	6	17.64	25	21.2
197	27	85	4.2	5	6	17.64	25	21.2
198	27	85	4.2	5	6	17.64	25	21.2
199	27	85	4.2	5	6	17.64	25	21.2
200	27	85	4.2	5	6	17.64	25	21.2

ΣX = 2,839

ΣY = 22,879

Correlation: $r =$

$$\frac{\sum xy}{\sqrt{\sum x^2} \sqrt{\sum y^2}} = \frac{2,688}{\sqrt{4,061.4} \times \sqrt{14,455}}$$

$$r = \frac{2,688}{62.27 \times 120.2} = \frac{2,688}{7,481} = 0.4748$$

$$P.E._r = \frac{.6745 \times (1-r^2)}{\sqrt{n}} = \frac{.6745 \times (1-.225)}{\sqrt{11.25}} = .552$$

P.E._T = 0.0485

Summary of Values of Coefficient of Correlation "r".

Class	1938	1937	1936	1935	1934
Kind of Test	N.U.	U.of I.	N.U.	N.U.	N.U.
Coefficient of Correlation	.732	.604	.61	.599	.4748
Cases Studied	238	340	276	194	124

Upon inspecting the preceding table one is struck by the close agreement between the results of algebra placement tests and the final grades. The highest value of r being $+0.732$, the lowest $+0.4748$, and the average $+0.6038$, out of a possible range of -1.0 to $+1.0$. Both tests are apparently very useful in predicting future performance. In individual cases they may vary widely, as shown by the data studied, but this variation is probably due more to lack of desire for study and excessive diversion of attention than to lack of ability or of preparation. By plotting a curve of algebra final grades against scores on the placement test it can be shown that there are more cases of poor correlation where the test mark is low and the grade average than where the test score is high and the grade low. The averaging feature of correlation, therefore, is not a serious disadvantage in this case since the test tends to show accurately those who are prepared to do good work, regardless of whether they actually do creditable work.

Of the two different placement tests studied neither has an apparent advantage as far as accuracy is concerned.

The ease of correction of the "home made" test, together with its low cost, makes it more desirable for this particular purpose and justify its retention in its present form. These conclusions apply to the results indicated by the correlations but a more complete picture may be obtained from an examination of the curves contained in the following pages. While the placement tests have been shown to be useful and rather accurate when used to divide an algebra class into sections of varying ability, it would be very desirable to see if there is any critical value of placement test score below which it can be said with a considerable degree of certainty that the subject will need special attention to enable him satisfactorily to complete the course.

With this object in mind, the curve on page 46 was plotted. To obtain data for this plot, the records of all students in the classes of '38, '36, '35, and '34 who failed college algebra were studied.

Their scores on the placement test were plotted as abscissae and the frequency of occurrence of each score in the total four years was plotted on the ordinate scale. The class of '37 was omitted from this plot since they had used a different placement test and their scores were not comparable with the rest of the group.

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Their scores on the placement test were plotted as abscissae and the frequency of occurrence of each score in the total four years was plotted on the ordinate scale. The class of '37 was omitted from this plot since they had used a different placement test and their scores were not comparable with the rest of the group.

It will be noticed that the curve is roughly the same shape as the normal probability curve, showing a small number of low grades, a corresponding small number of high

grades, and a large number of average grades. From an examination of the curve, it may also be seen that a score of 16 appears 7 times, the largest frequency of any score, and that the curve takes a sudden drop after this point. Forty-seven men got a score of 16 or less while only eight got a score above 16 and no one in four years who failed the course got a score above 24. This would seem to indicate that segregating all those who obtain a score of 16 or less would include practically all of the men who would normally fail the course. It would probably also include some who would pass with low grades and a few who would pass with good grades.

To try to indicate the placement test scores obtained by those who get low passing grades as well as those who fail algebra, an ogive curve has been plotted for all men in each of the five classes who received a final grade of seventy or less. These ogives appear on pages 49, 50, 51, 52, and 53. The abscissa consists of placement scores and the ordinate of numbers of cases.

Since these curves include the failing marks as well as the low passing grades it is to be expected that they will bear out the conclusions based on the curves previously drawn for men who failed the course. It can be determined from the ogive of '38 on page 49 that the steepest part of

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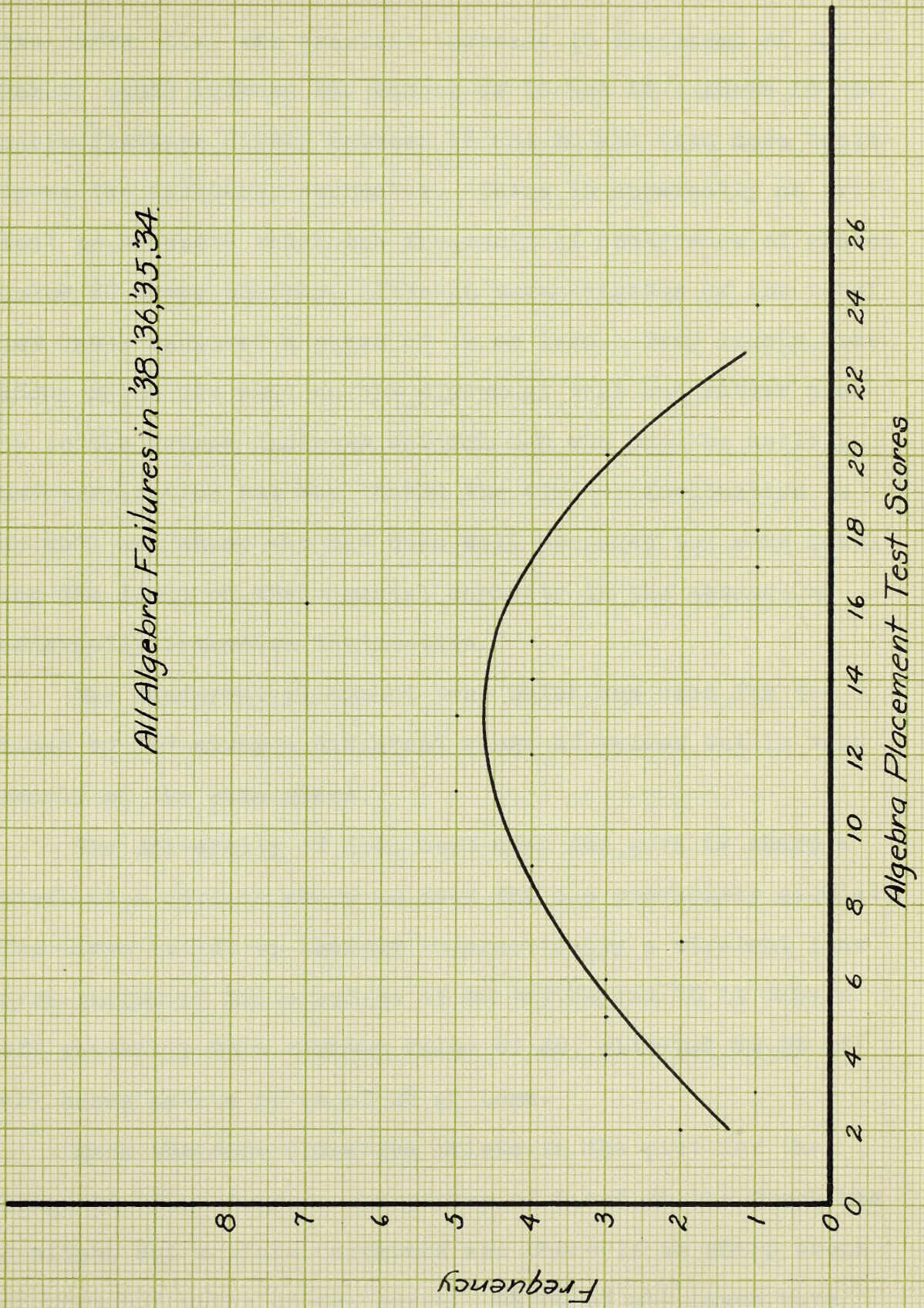
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All Algebra Failures in '38, '36, '35, '34.



the curve, i.e. the greatest increase in frequency of occurrence, comes between the scores of 10 and 15. Above 15 the curve flattens slowly between 15 and 20 and then more rapidly as the frequency decreases. There is apparently no critical point above which the frequency of occurrence of grades below 70 drops sharply, although seven-eighths of the total low cases received a score of 19 or less. Very likely, the group which did well on the placement test and rather poorly in the course includes several men who had the ability and preparation but who lacked the time or inclination to do well and those who had been well prepared but were reaching the limit of their mental capacity in the absence of abnormally intensive instruction.

The different placement test which was used for the class of '37 gives a different range of values but is very nearly of the same shape.

The University of Iowa test does not give as sharp a break at a certain score as does the one previously studied. The curve builds up sharply in practically a straight line from scores of 10 to scores of 30 and beyond 30 it tapers off gradually to a maximum value of 50, although 89.5% of all cases have a score of 35 or less.

Much the same situation exists in the plot for the class of '36. Between the scores of 5 and 25 the graph has a slight but uniform curvature and there is no sharp break or critical point on the curve. 98.5% of all cases have

the curve, i.e. the greatest increase in frequency of occurrence comes between the scores of 10 and 15. Above 15 the curve flattens slowly between 15 and 20 and then more rapidly as the frequency decreases. There is apparently no critical point above which the frequency of occurrence of grades below 70 drops sharply, although seven-eighths of the total low cases received a score of 15 or less. Very likely, the group which did well on the placement test and rather poorly in the course includes several men who had the ability and preparation but who lacked the time or inclination to do well and those who had been well prepared but were reaching the limit of their mental capacity in the absence of abnormally intensive instruction.

The different placement test which was used for the class of '37 gives a different range of values but is very nearly of the same shape.

The University of Iowa test does not give as sharp a break at a certain score as does the one previously studied. The curve builds up sharply in practically a straight line from scores of 10 to scores of 30 and beyond 30 it tapers off gradually to a maximum value of 50, although 89.5% of all cases have a score of 35 or less.

Much the same situation exists in the plot for the class of '36. Between the scores of 5 and 25 the graph has a slight but uniform curvature and there is no sharp break or critical point on the curve. 98.5% of all cases have

scores of 25 or less and 84.7% have scores of 20 or less.

The graph for the class of '35 does not have such a regular curvature. Between the scores of 10 and 15 the curve is steepest and above or below this point the shape is nearly the same. 95.2% of all cases have a score of 25 or less, 90.5% have a score of 20 or less and 66.7% have a score of 15 or less.

The graph for the class of '34 is not as nearly symmetrical as the preceding one. The steepest part of the curve comes between scores of 15 and 20. All cases have scores below 25, 90.5% have scores of 20 or less, and 52.4% have scores of 15 or less.

Both the general trend curve and the ogive curves previously plotted show special phases of the situation. It is believed to be advantageous to plot all algebra final grades against their corresponding placement test scores. This plot is not one of the standard kinds ordinarily used but was developed for this particular problem. It simply consists of all algebra final grades as ordinates plotted against all algebra placement test scores as abscissae. This series of plots, one for each of the five years, is included on pages 49, 50, 51, 52, and 53.

scores of 25 or less and 64.7% have scores of 30 or less.

The graph for the class of '35 does not have such a

regular curvature. Between the scores of 10 and 15 the

curve is steepest and above or below this point the shape

is nearly the same. 95.2% of all cases have a score of 25

or less, 90.5% have a score of 30 or less and 66.7% have a

score of 15 or less.

The graph for the class of '34 is not as nearly symmet-

rical as the preceding one. The steepest part of the curve

comes between scores of 15 and 20. All cases have scores

below 25, 90.5% have scores of 30 or less, and 62.4% have

scores of 15 or less.

Both the general trend curve and the ogive curves pre-

viously plotted show special phases of the situation. It

is believed to be advantageous to plot all algebra final

grades against their corresponding placement test scores.

This plot is not one of the standard kinds ordinarily used

but was developed for this particular problem. It simply

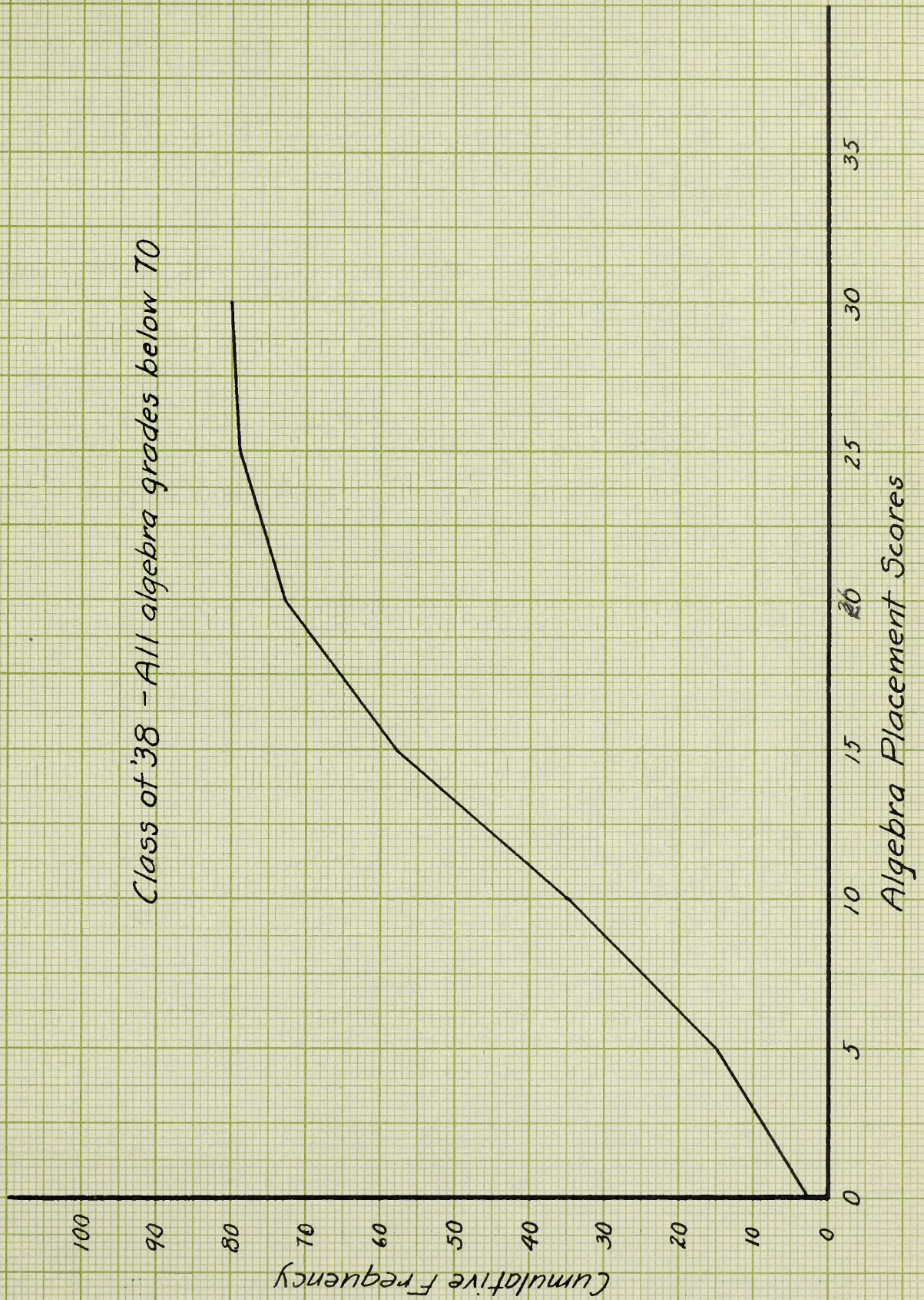
consists of all algebra final grades as ordinates plotted

against all algebra placement test scores as abscissae.

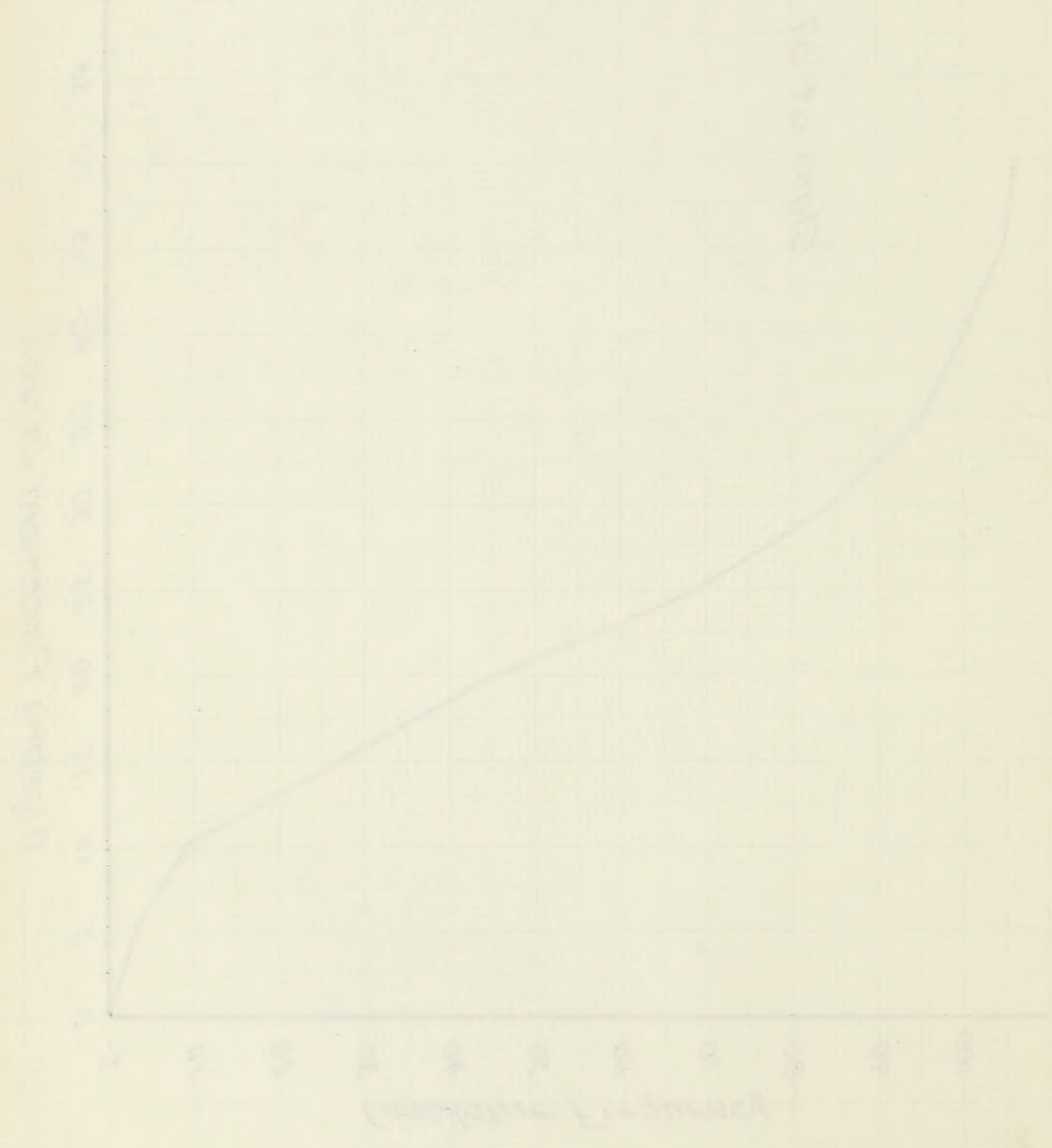
This series of plots, one for each of the five years, is

included on pages 49, 50, 51, 52, and 53.

Class of '38 - All algebra grades below 70

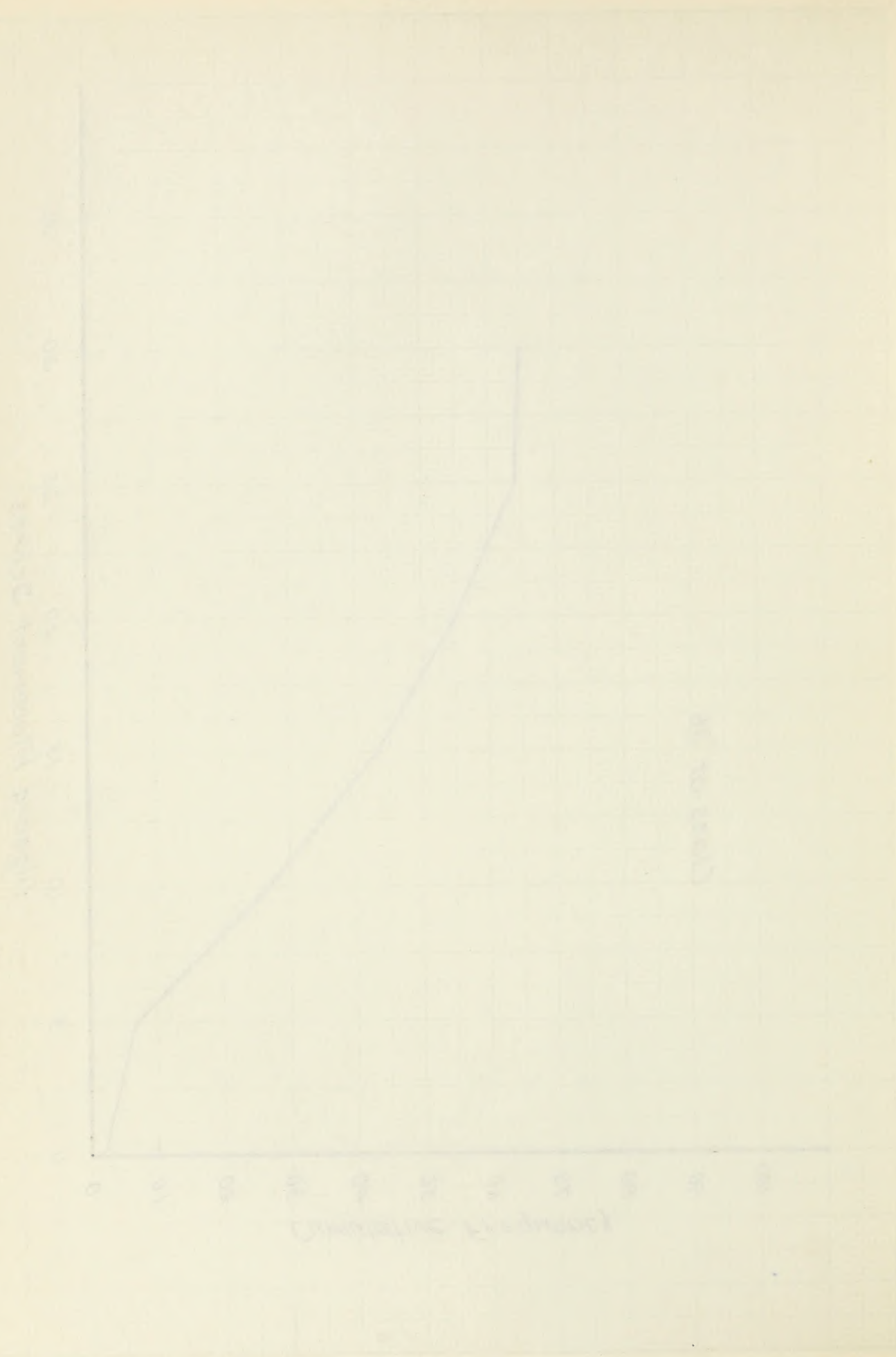


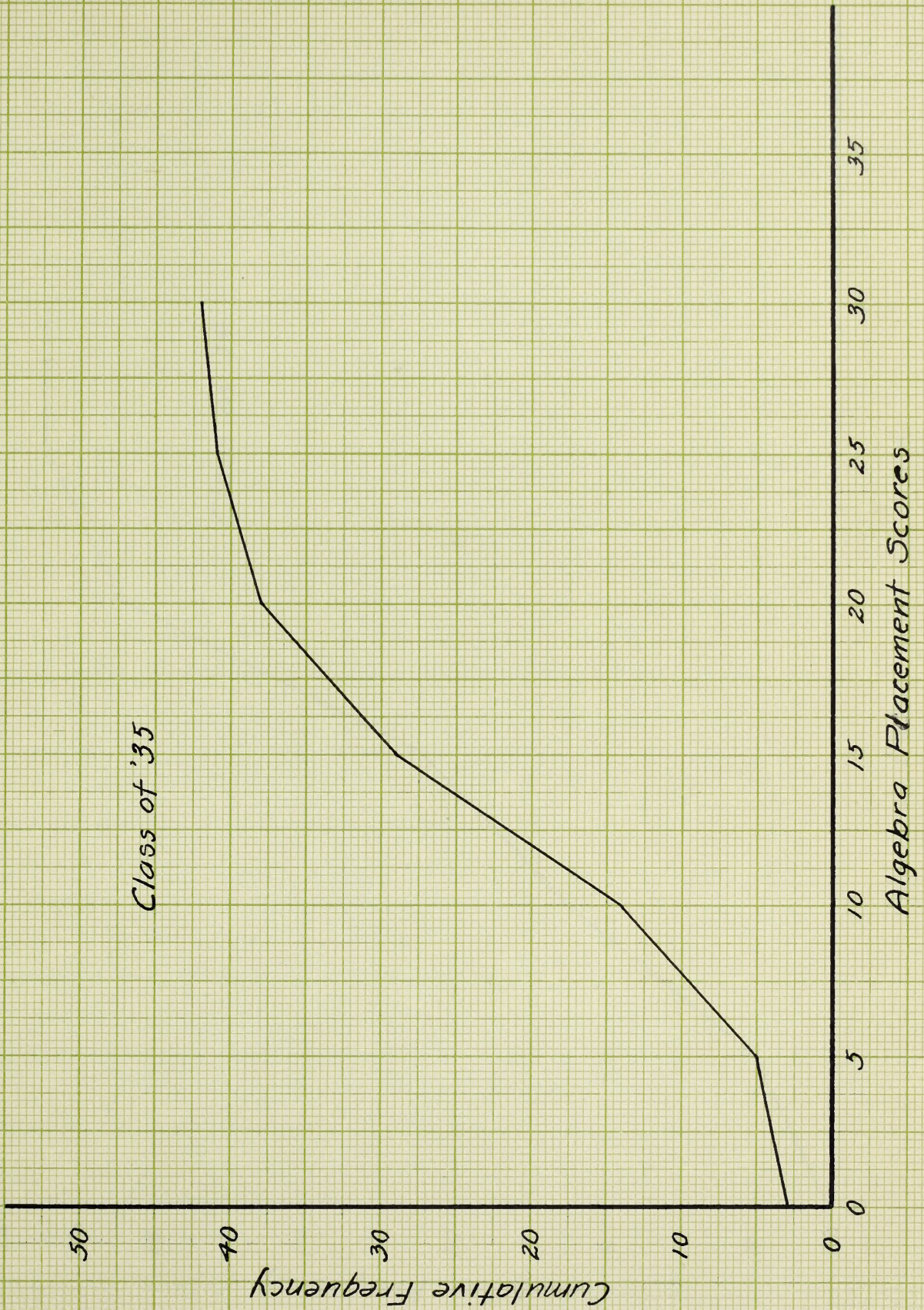




Class of '36

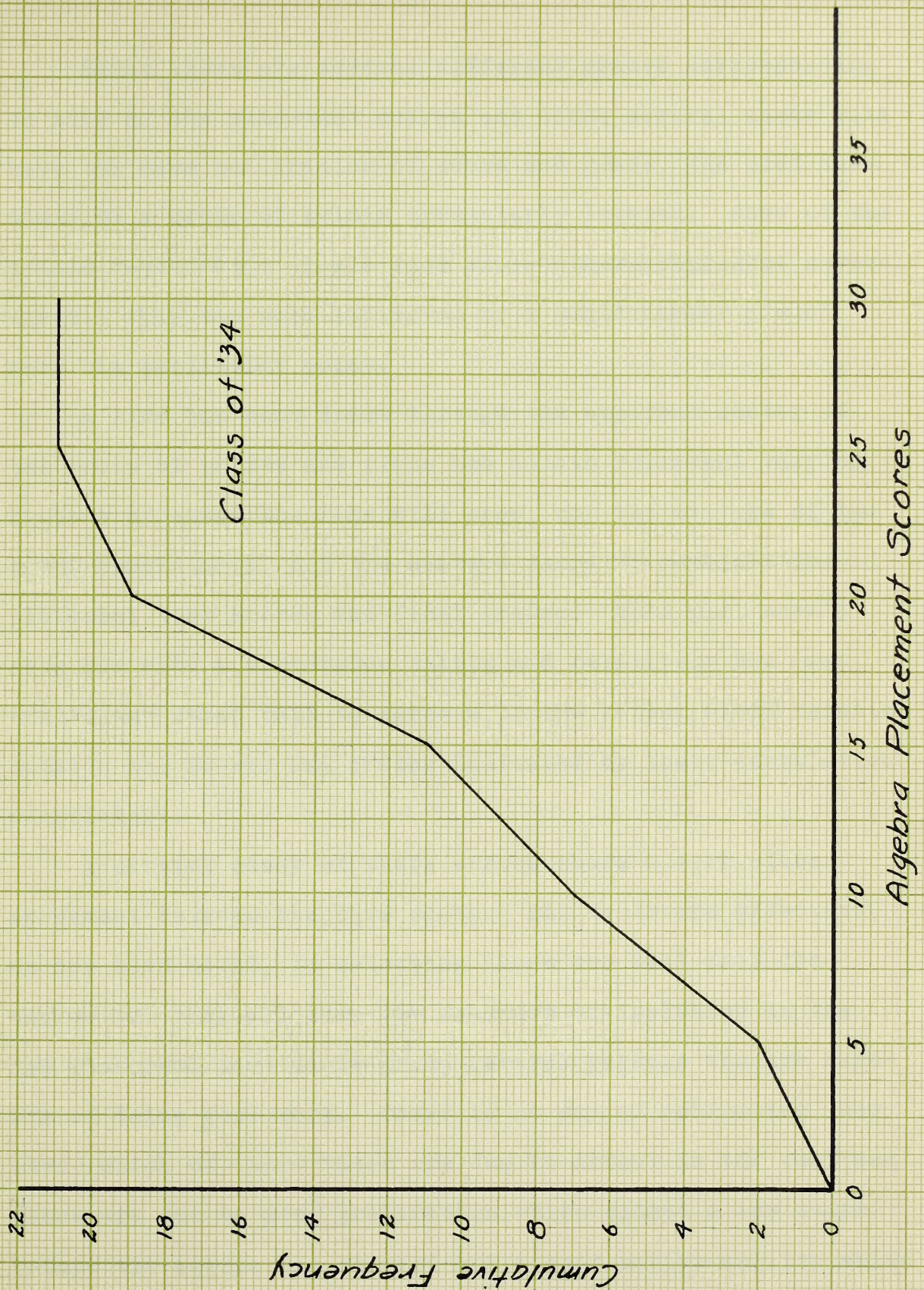








Graph of $y = \sqrt{x}$



Effect of pressure on volume



Since there are several different grades corresponding to some of the placement scores and since several cases will have the same combination of score and grade, the plot consists of a group of points irregularly located. Some of the points represent a single case while others represent several cases. This has been indicated by a small number placed near the particular point.

A line has been drawn through the apparent center of the group of points and since the points represent varying numbers of cases the line will show, not the average of the group numerically, but the average range of combinations of placement test scores and final grades. This plot should show how wide a dispersion exists and relatively how many individual cases fail to agree with the rather close relation between the scores and grades indicated by their correlation coefficient.

A careful study of these curves shows a very close agreement between the five plots. All tests are effective, as has been noted, in selecting those who will fail the course but they all have the weakness of including in the low placement test score group several persons who are capable of doing good work. There is no way of estimating, however, which of these cases are due to defect in the test and which are due to poor preparation which caused a low score before the course was started and a good native ability which helped the student to grasp the material presented and

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eventually do very credible work. Possibly, examination of the Army Alpha rating of all those getting a low placement score would help but most likely there will always be several doubtful cases.

The University of Iowa test appears to have a slight advantage over the other test in having very few cases of low test score and high final grade, but it does not appear quite as good in indicating future failure. The differences are too slight, however, and the data too incomplete to draw definite conclusions.

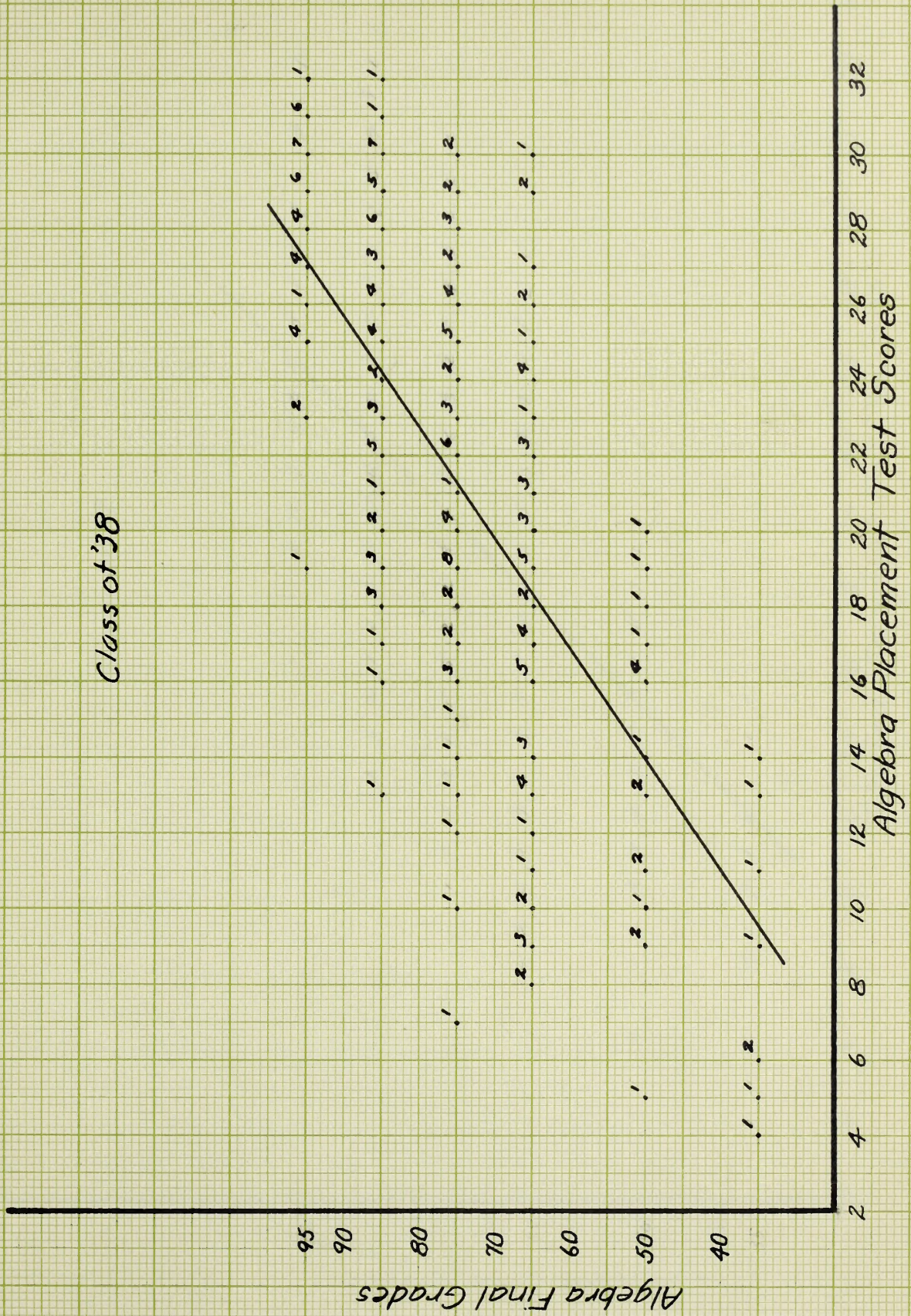
A good solution to this problem may be to make up section assignments on the basis of comparative test scores and after the first four or five weeks shift to a higher section those who apparently are capable of doing the requisite amount and quality of work. One danger always present when classes are sectioned on the basis of apparent ability is that the lower ranking sections may acquire an inferiority complex and come to believe themselves incapable of doing other than mediocre work. Therefore, it may be necessary to decide whether the better students should be penalized by lack of sectioning or whether the poorer ones are labeled as such by the creation of an ability section system. It is believed by many educators that this difficulty may be minimized by proper motivation and good teaching technique.

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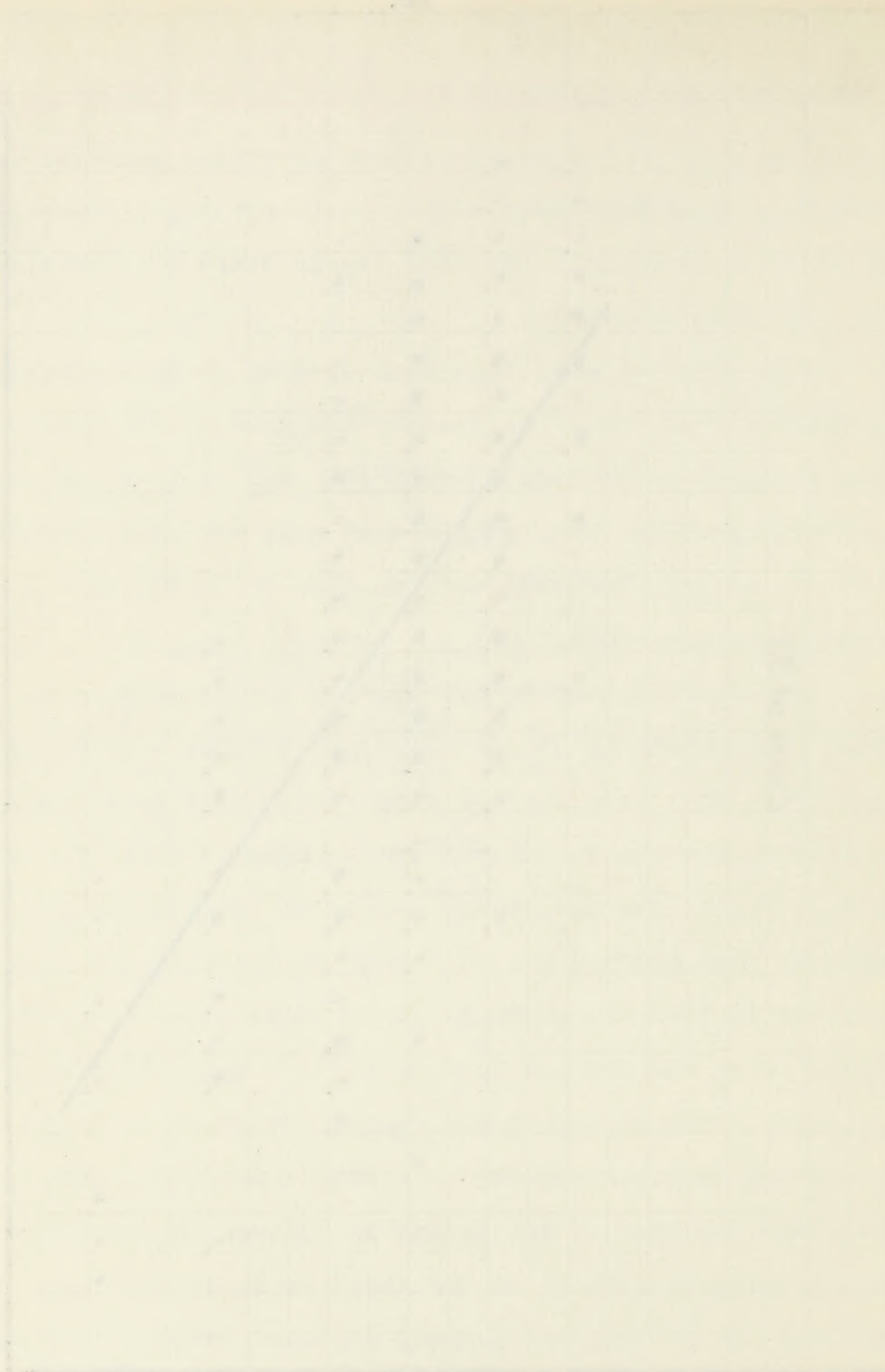
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Class of '38

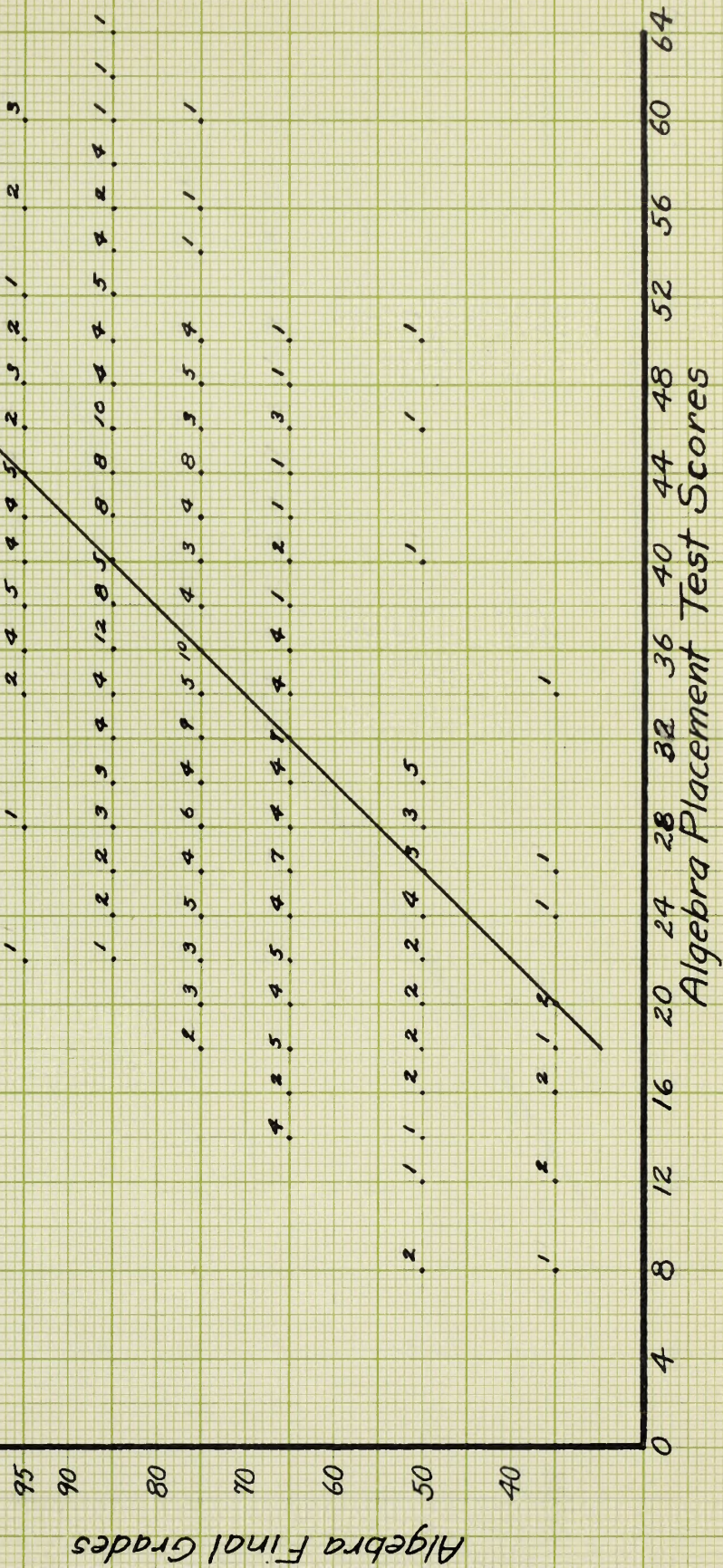


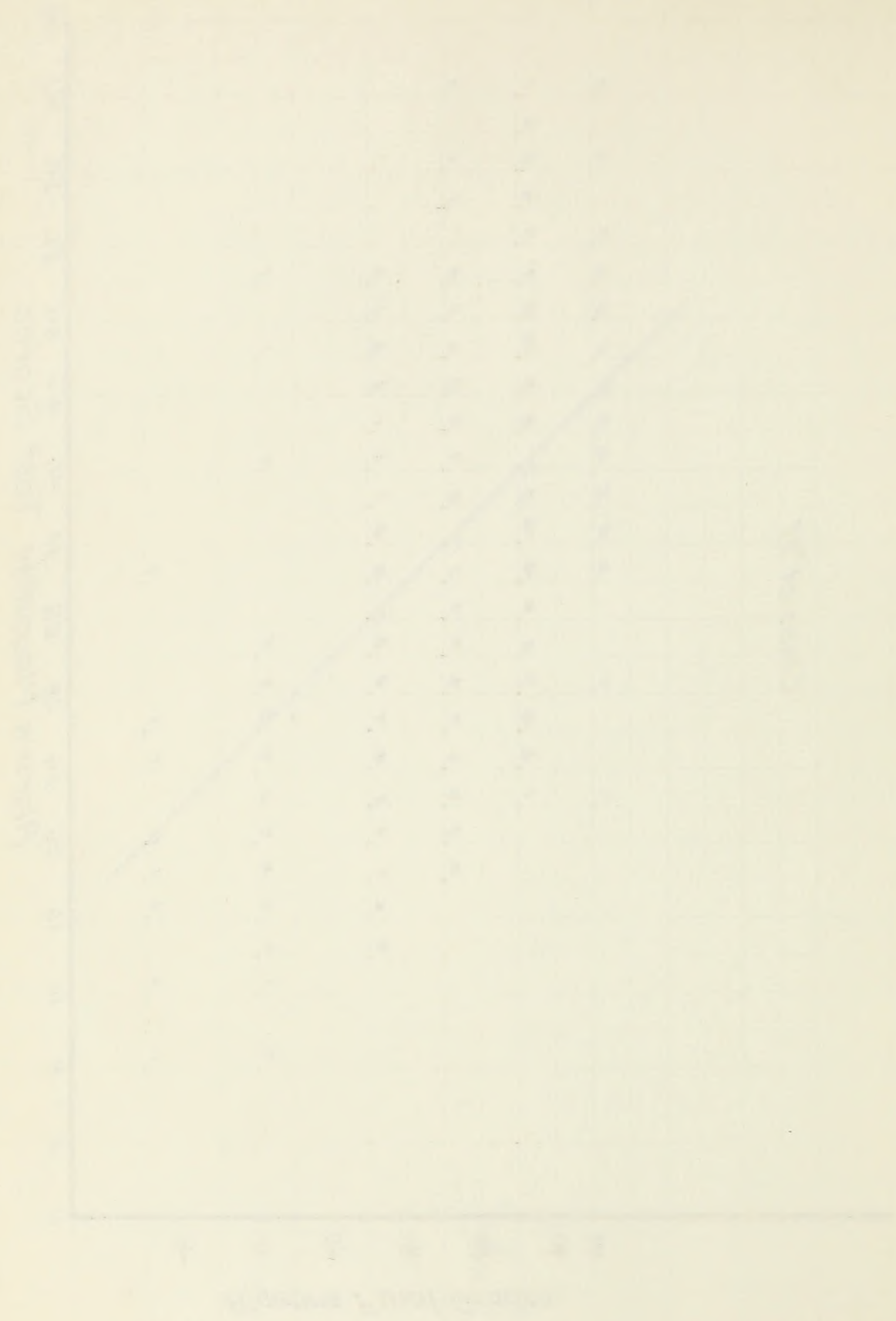
Wavelength (nm)



Wavelength (nm)

Class of '37

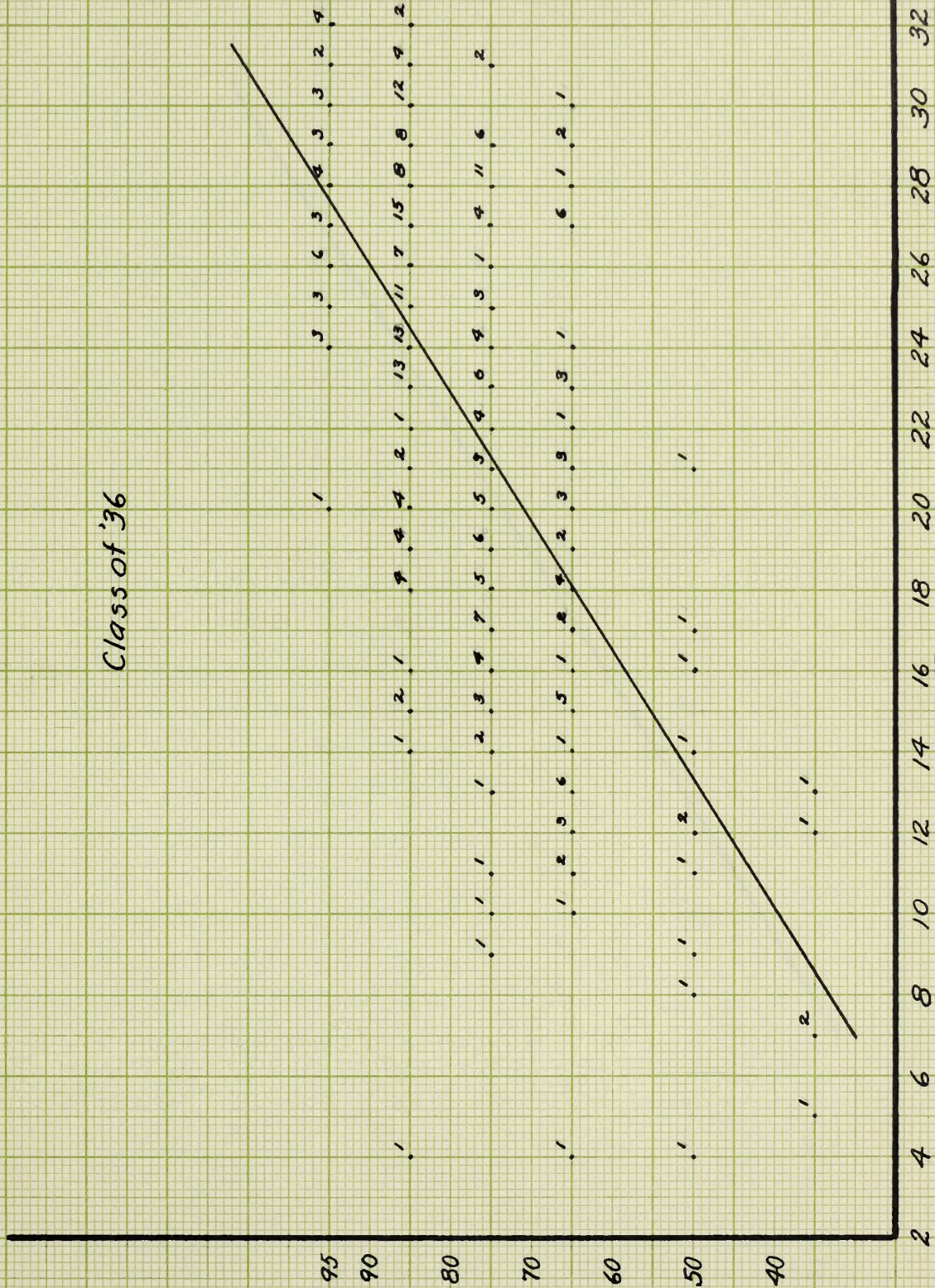


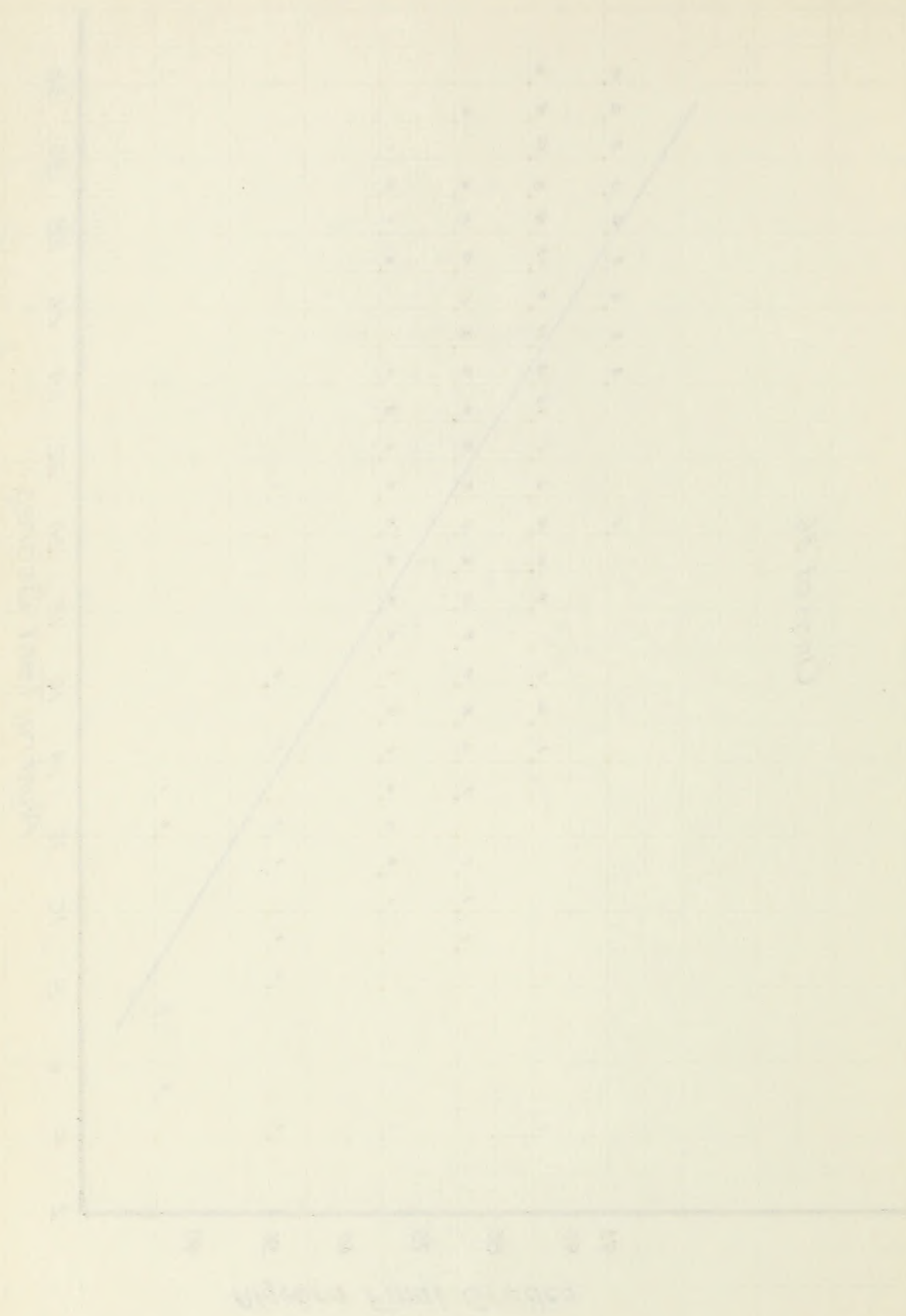


Class of '36

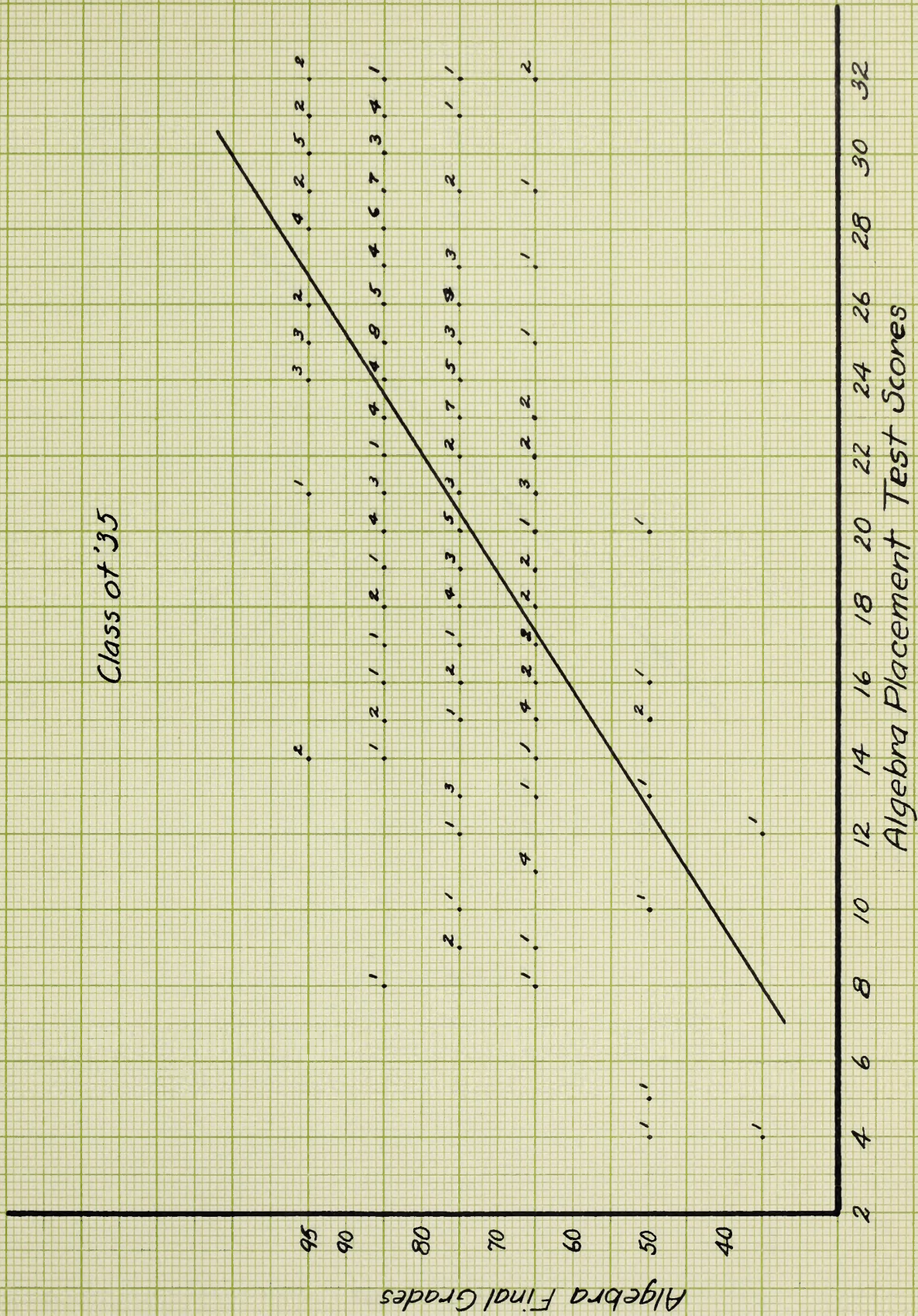
Algebra Final Grades

Algebra Test Scores

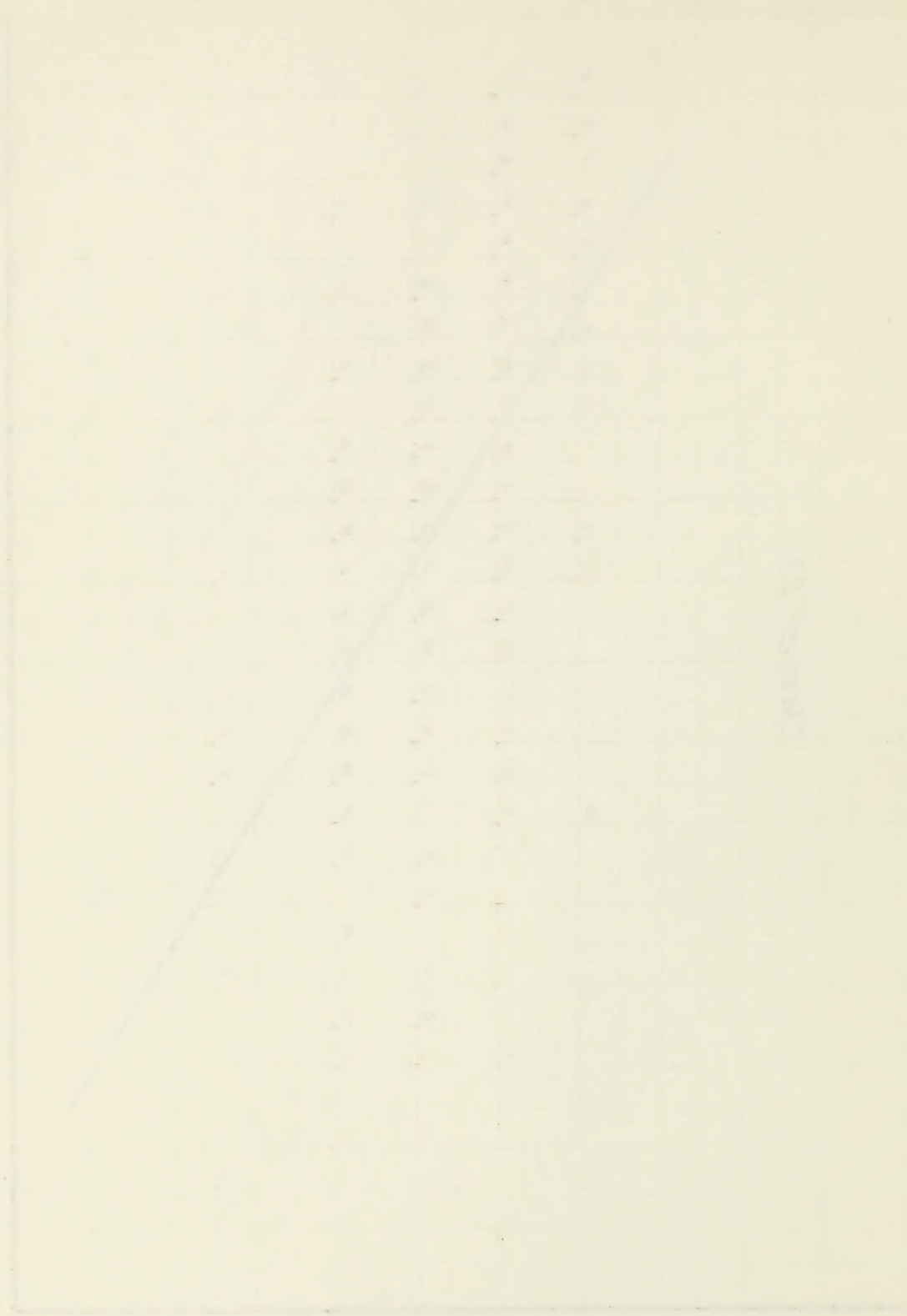




Class of '35



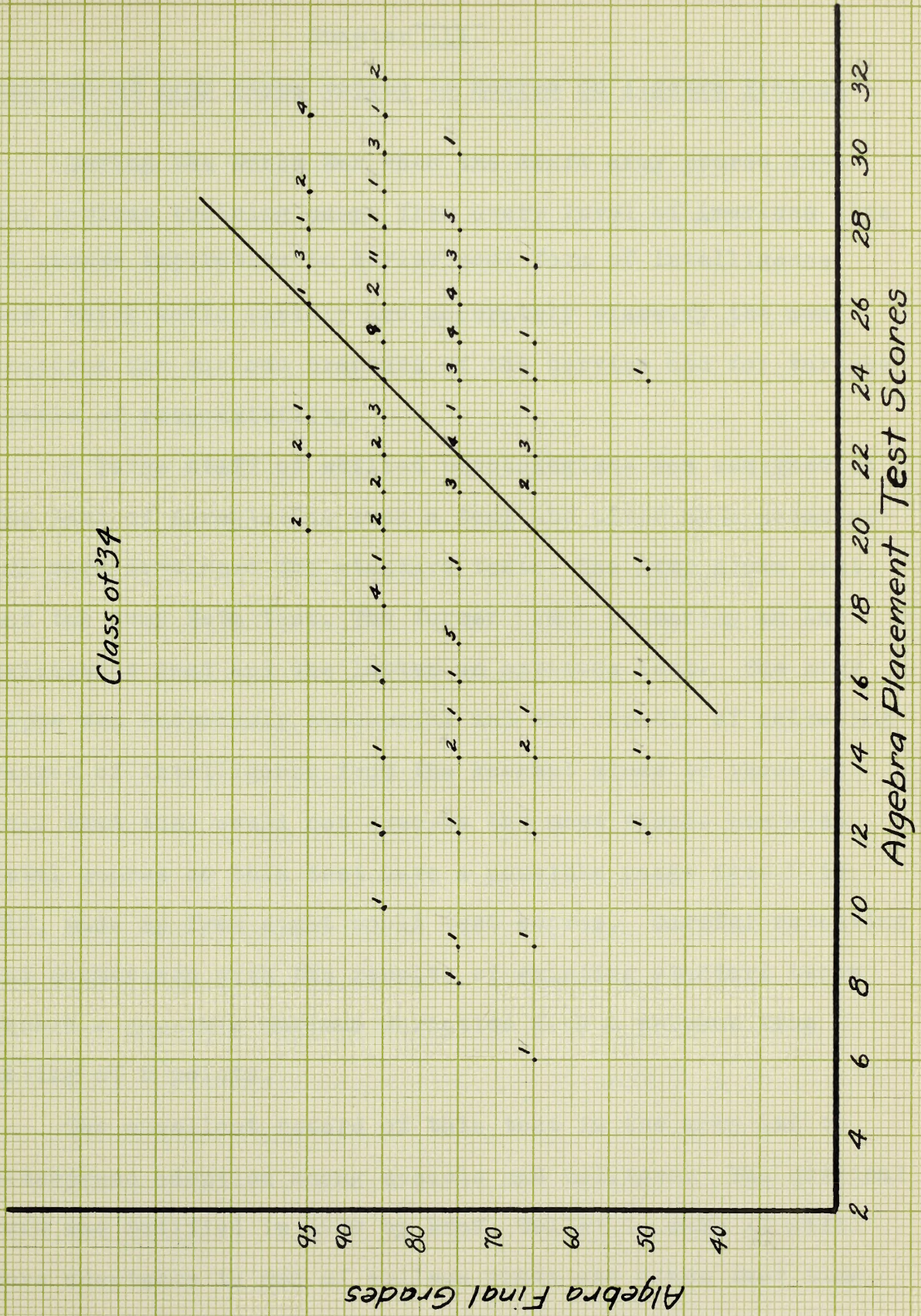
Time (minutes) 0-100



0 1 2 3 4 5 6 7 8 9 10

Unlabeled Variable

Class of '34

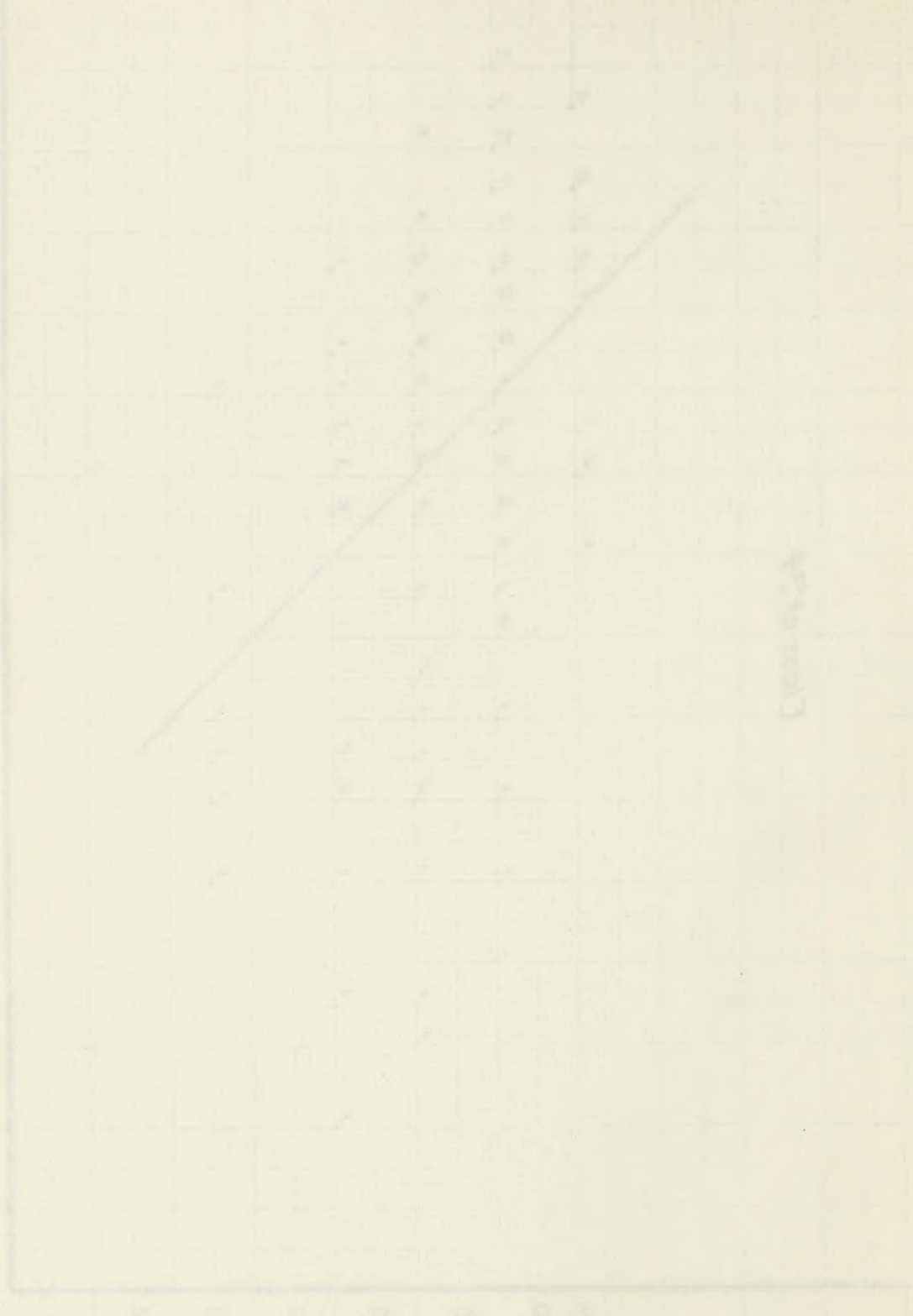


Weight (gms) 1957-1960

Control

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200

Standard Error of Mean



Chapter III.Relation of Army Alpha scores to Scores on Algebra Pretest

During the World War when the draft army poured into the various training camps from every level of American life it became imperative to devise some form of intelligence test which would rapidly and accurately classify the men received for various branches of the service and for various levels of responsibility.

A large staff of skilled psychologists was assigned to the task of formulating such a test and after much painstaking work developed two standard tests: the Army Alpha test, and the Army Beta test. The former is primarily an intelligence test and the latter an aptitude test. The Army Alpha was enormously successful and was capable of selecting ranges of intelligence from the keenest minds to those so dull that they could not execute the most simple commands. Total scores on this test have a possible range from 0 to 212, made up from eight small test scores. Careful retesting and comparison with the results of existing standard tests showed a possible maximum variation from a persons true rating of 5 points.

The excellent record of this test in the army led to widespread adoption among schools and colleges. The original form was modified in 1929 by Prof. Wells' to make it still more adaptable to men of college grade and since that time both the original and modified form have been widely used.

Chapter III.

Relation of Army Alpha Scores to Scores on Alford's Present

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The excellent record of this test in the army led to widespread adoption among schools and colleges. The original form was modified in 1923 by Prof. Willis to make it still more adaptable to men of college grade and since that time both the original and modified form have been widely used.

For some years the Army Alpha has been administered to all entering freshmen where this study is being carried out. The scores were recorded and were used among other indications of the student's capacity in judging whether he was doing as well as could be expected.

It had occurred to the author that since a person's progress in studies, like algebra is controlled in considerable measure by his intelligence, that there might very likely be a close correlation between a student's score on the Army Alpha and his score on the algebra placement test. If this proved to be the case it would be desirable to drop the placement test completely and use the Army Alpha scores both for general reference purposes and for making up the algebra section assignments.

Accordingly it was decided to correlate the scores of the classes of 1938, 1937, 1936, 1935, and 1934 on the Army Alpha test with their scores on the algebra placement test. Of these scores those of 1938 and 1937 were made on Wells' revision of the Army Alpha while those of 1936, 1935, and 1934, were made on the original Alpha test. The source of the algebra placement tests used has already been discussed in the previous chapter.

The tabulations and calculations for the coefficient of correlation are listed in the following pages.

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Accordingly it was decided to correlate the scores of the classes of 1932, 1937, 1938, 1939, 1940, and 1941 on the Army Alpha test with their scores on the algebra placement test. Of these scores those of 1938 and 1937 were made on Well's revision of the Army Alpha while those of 1939, 1940, and 1941 were made on the original Alpha test. The source of the algebra placement tests used has already been discussed in the previous chapter.

The tabulations and calculations for the coefficient

of correlation are listed in the following pages.

TABLE IV a (1938)

Correlation of Army Alpha and Algebra Placement Test Scores

No.	X	Y	x	y	x ²	y ²	xy
38-1	17	127	- 44.1	- 7.7	16.81	59.29	31.57
2	20	89	- 1.1	-45.7	1.21	2088.49	50.27
3	18	99	- 3.1	-35.7	9.61	1274.49	110.67
4	16	125	- 5.1	- 9.7	26.01	94.09	49.47
5	30	138	8.9	3.7	79.21	10.89	29.37
6	28	119	6.9	-15.7	47.61	246.49	108.33
7	18	122	- 3.1	-12.7	9.61	161.29	39.37
8	30	147	8.9	12.3	79.21	151.29	109.47
9	24	105	2.9	-29.7	8.41	882.09	- 86.13
10	11	80	-10.1	-54.7	102.01	2992.09	552.47
11	15	137	- 6.1	2.3	37.21	5.29	- 14.03
12	3	139	-18.1	4.3	327.61	18.49	- 77.83
13	16	141	- 5.1	6.3	26.01	39.69	- 32.13
14	18	104	- 3.1	- 30.7	9.61	942.49	95.17
15	19	114	- 2.1	-20.7	4.41	428.49	43.47
16	24	157	2.9	22.3	8.41	497.29	64.67
17	26	158	4.9	23.3	24.01	542.89	114.17
18	19	124	- 2.1	-10.7	4.41	114.49	22.47
19	16	127	- 5.1	- 7.7	26.01	59.29	39.27
20	22	136	.9	1.3	.81	1.69	1.17
21	23	111	1.9	-23.7	3.61	561.69	- 45.03
22	32	116	10.9	-18.7	118.81	349.69	-203.83
23	11	108	-10.1	-26.7	102.01	712.89	269.67
24	31	167	9.9	32.3	98.01	1043.29	319.77
25	30	125	8.9	- 9.7	79.21	94.09	- 86.33
26	25	106	3.9	-28.7	15.21	823.69	-111.93
27	25	151	3.9	16.3	15.21	265.69	63.57
28	19	119	- 2.1	-15.7	4.41	246.49	32.97
29	28	136	6.9	1.3	47.61	1.69	8.97
30	9	103	-12.1	-31.7	146.41	1004.89	383.57
31	12	121	- 9.1	-13.7	82.81	187.69	124.67
32	19	89	- 2.1	-45.7	4.41	2088.49	95.97
33	23	160	1.9	25.3	3.61	640.09	48.07
34	23	151	1.9	16.3	3.61	265.69	30.97
35	20	118	- 1.1	-16.7	1.21	278.89	18.37
36	26	155	4.9	20.3	24.04	412.09	99.47
37	20	154	- 1.1	19.3	1.21	372.49	- 21.23
38	27	136	5.9	1.3	34.81	1.69	7.67
39	28	150	6.9	15.3	47.61	234.09	105.57
40	29	171	7.9	36.3	62.41	1317.69	286.77
41	19	119	- 2.1	-15.7	4.41	246.49	32.97
42	22	134	.9	.7	.81	.49	.63
43	18	116	- 3.1	-18.7	9.61	349.69	57.97
44	25	141	3.9	6.3	15.21	39.69	24.57
45	9	140	-12.1	5.3	146.41	28.09	- 64.13
46	29	165	7.9	30.3	62.41	918.09	239.37

TABLE IV a (1948)

Correlation of Army Alpha and Alpha Placement Test Scores

No.	X	Y	X	Y	X	Y	X	Y
28-1	14	137	-4.1	-7.7	13.81	63.33	21.57	
2	20	89	-1.1	-43.7	1.81	2088.43	50.37	
3	18	99	-3.1	-35.7	9.61	1374.43	110.37	
4	15	128	-5.1	-9.7	25.01	94.03	49.47	
5	20	138	8.9	3.7	79.21	10.83	39.37	
6	28	119	6.9	-15.7	47.61	345.43	108.33	
7	18	133	-3.1	-13.7	9.61	151.33	39.37	
8	20	147	8.9	13.3	79.21	151.33	109.47	
9	24	105	3.9	-33.7	8.41	683.03	-33.13	
10	11	80	-10.1	-34.7	102.01	3333.03	533.47	
11	15	137	-5.1	3.3	27.21	5.33	-14.03	
12	3	139	-13.1	4.3	177.61	18.43	-77.33	
13	15	141	-5.1	6.3	25.01	69.33	-33.13	
14	18	104	-3.1	-30.7	9.61	343.43	35.17	
15	19	114	-3.1	-30.7	4.41	438.43	43.47	
16	28	153	3.9	33.3	8.41	437.33	54.37	
17	25	153	4.9	33.3	24.01	643.33	114.17	
18	19	134	-3.1	-10.7	4.41	114.43	33.47	
19	15	137	-5.1	-7.7	25.01	59.33	39.37	
20	23	135	3	1.3	1.81	1.33	1.17	
21	23	111	1.9	-33.7	3.61	531.33	-43.03	
22	23	115	10.9	-18.7	118.81	343.33	-303.33	
23	11	108	-10.1	-35.7	102.01	713.33	239.37	
24	21	127	3.9	33.3	98.01	1043.33	219.77	
25	20	135	8.9	-9.7	79.21	94.03	-33.33	
26	25	105	3.9	-33.7	15.21	833.33	-111.33	
27	23	131	3.9	13.3	15.21	333.33	33.37	
28	19	119	-3.1	-13.7	4.41	343.43	33.37	
29	23	135	6.9	1.3	47.61	1.33	8.37	
30	9	103	-13.1	-31.7	148.41	1003.33	333.37	
31	13	121	-9.1	-13.7	82.81	137.33	133.37	
32	19	89	-3.1	-43.7	4.41	2088.43	33.37	
33	23	150	1.9	33.3	3.61	640.03	43.07	
34	23	121	1.9	13.3	3.61	333.33	30.37	
35	20	113	-1.9	-13.7	1.21	378.33	18.37	
36	23	135	4.9	30.3	24.01	413.03	33.47	
37	20	134	-1.1	13.3	1.21	373.43	-31.33	
38	27	135	5.9	1.3	33.61	1.33	7.37	
39	28	150	6.9	13.3	47.61	334.03	105.37	
40	29	171	7.9	33.3	63.41	1317.33	333.77	
41	19	119	-3.1	-13.7	4.41	343.43	33.37	
42	23	134	3	7	1.81	43	33	
43	18	113	-3.1	-13.7	9.61	343.33	37.37	
44	23	141	3.9	6.3	15.21	33.33	34.37	
45	9	140	-13.1	3.3	148.41	38.03	-34.13	
46	29	155	17.9	30.3	32.41	313.03	333.37	

TABLE IV a (1938)

No.	X	Y	x	y	x ²	y ²	xy
47	27	132	5.9	- 2.7	34.81	7.29	- 15.93
48	17	148	- 4.1	13.3	16.81	176.89	- 54.53
49	11	116	-10.1	-18.7	102.01	349.69	188.87
50	18	96	- 3.1	-38.7	9.61	1497.69	119.97
51	14	136	- 7.1	1.3	50.41	1.69	- 9.23
52	16	127	- 5.1	- 7.7	26.01	59.29	39.27
53	26	137	4.9	2.3	24.01	5.29	11.27
54	17	152	- 4.1	17.3	16.81	299.29	- 70.93
55	14	53	- 7.1	18.3	50.41	334.89	-129.93
56	18	109	- 3.1	-25.7	9.61	660.49	79.67
57	26	116	4.9	-18.7	24.01	349.69	- 91.63
58	25	163	3.9	28.3	15.21	800.89	110.37
59	28	137	6.9	2.3	47.61	5.29	15.87
60	17	144	- 4.1	9.3	16.81	86.49	- 46.53
61	8	154	-13.1	19.3	171.61	372.49	-252.83
62	23	136	1.9	1.3	3.61	1.69	2.47
63	16	127	- 5.1	- 7.7	26.01	59.29	39.27
64	17	122	- 4.1	-12.7	16.81	161.29	59.69
65	27	148	5.9	13.3	34.81	176.89	78.47
66	23	151	1.9	16.3	3.61	265.69	30.97
67	25	121	3.9	-13.7	15.21	187.69	- 53.43
68	16	149	- 5.1	14.3	26.01	204.49	- 72.93
69	31	167	9.9	32.7	98.01	1069.29	-323.73
70	17	125	- 4.1	- 9.7	16.81	94.09	39.77
71	22	126	.9	- 8.7	.81	75.69	- 7.83
72	11	101	-10.1	-33.7	102.01	1135.69	340.37
73	17	156	- 4.1	21.3	16.81	453.69	- 87.33
74	29	163	7.9	28.3	62.41	800.89	223.57
75	19	100	- 2.1	-34.7	4.41	1204.09	72.87
76	20	134	- 1.1	.7	1.21	.49	.77
77	25	137	3.9	2.3	15.21	5.29	8.97
78	31	147	9.9	12.3	98.01	151.29	121.77
79	18	122	- 3.1	-12.7	9.61	161.29	39.37
80	26	152	4.9	17.3	24.01	299.29	84.77
81	22	148	.9	13.3	.81	176.89	11.97
82	23	114	1.9	-20.7	3.61	428.49	- 39.33
83	30	128	8.9	- 6.7	79.21	44.89	- 59.63
84	28	184	6.9	49.3	47.61	2430.49	340.17
85	14	149	- 7.1	14.3	50.41	204.49	-101.53
86	28	115	6.9	-19.7	47.61	388.09	-135.93
87	5	150	-16.1	15.3	259.21	234.09	-246.33
88	29	134	7.9	.7	62.41	.49	- 5.53
89	31	144	9.9	9.3	98.01	86.49	92.07
90	26	111	4.9	-23.7	24.01	561.69	-116.13
91	27	137	5.9	2.3	34.81	5.29	13.57
92	24	182	2.9	47.3	8.41	2237.29	137.17
93	9	121	-12.1	-13.7	146.41	181.69	165.77
94	30	154	8.9	19.3	79.21	372.49	171.77

TABLE IV a (1938)

No.	X	Y	X	Y	X	Y	X
47	27	128	8.8	- 8.7	34.81	7.38	- 13.33
48	17	148	- 4.1	13.3	18.81	178.83	- 34.33
49	11	118	-10.1	-18.7	103.01	343.83	138.87
50	18	98	- 3.1	-38.7	4.81	1447.83	119.37
51	14	138	- 7.1	1.8	50.41	1.88	- 9.33
52	16	127	- 6.1	- 7.7	28.01	32.33	39.37
53	28	137	4.3	2.3	32.01	8.33	11.37
54	17	132	- 4.1	17.3	18.81	320.33	- 70.33
55	16	12	- 7.1	18.3	30.41	334.83	-134.33
56	18	103	- 3.1	-33.7	9.81	680.83	79.37
57	28	118	4.3	-18.7	34.01	184.83	- 21.33
58	28	133	4.3	33.3	18.81	600.83	110.37
59	28	127	4.3	3.3	47.81	1.33	11.37
60	17	144	- 4.1	4.3	18.81	38.43	- 48.33
61	8	154	-13.1	12.3	171.81	372.43	-382.33
62	23	136	1.3	1.3	5.81	1.88	2.47
63	16	127	- 5.1	- 7.7	38.01	62.33	32.37
64	17	123	- 4.1	-12.7	18.81	181.33	- 62.33
65	27	148	5.3	13.3	34.81	178.83	78.47
66	28	121	1.3	18.3	8.81	388.83	30.47
67	28	121	3.3	-13.7	13.81	187.83	- 33.43
68	16	143	- 5.1	14.3	28.01	304.43	- 72.47
69	21	137	3.3	33.7	98.01	1032.33	-332.73
70	17	128	- 4.1	- 9.7	18.81	34.03	- 32.77
71	22	128	3	- 8.7	81	78.83	- 7.83
72	11	101	-10.1	-33.7	103.01	1132.33	340.37
73	17	128	- 4.1	21.3	18.81	432.83	- 87.33
74	23	123	7.3	28.3	52.41	800.83	223.47
75	19	100	- 8.1	-34.7	4.41	1304.03	72.87
76	20	124	- 1.1	7	1.81	43	77
77	25	127	3.3	2.3	18.81	8.33	8.37
78	21	147	3.3	12.3	98.01	181.33	181.77
79	18	123	- 3.1	-12.7	9.81	181.33	32.37
80	28	123	4.3	17.3	34.01	332.33	84.77
81	22	148	3	12.3	81	178.83	11.47
82	22	114	1.3	-20.7	9.81	428.43	- 32.33
83	30	128	8.3	- 6.7	79.81	44.83	- 32.33
84	28	124	5.3	48.3	47.81	2430.43	340.17
85	14	143	- 7.1	14.3	50.41	304.43	-101.33
86	28	118	6.3	-19.7	47.81	388.03	-132.33
87	8	130	-16.1	15.3	332.81	324.03	-248.33
88	23	124	7.3	7	63.41	43	- 3.33
89	21	144	3.3	3.3	38.01	88.43	32.07
90	26	111	4.3	-33.7	34.01	581.83	-116.13
91	27	127	5.3	8.3	34.81	5.33	13.37
92	24	123	2.3	47.3	8.41	2337.33	137.17
93	2	121	-12.1	-13.7	148.41	181.83	132.77
94	20	124	8.3	12.3	79.81	372.43	171.77

TABLE IV a (1938)

No.	X	Y	x	y	x ²	y ²	xy
95	13	128	- 8.1	- 6.7	65.61	44.89	54.27
96	10	149	-11.1	14.3	123.21	204.49	-158.73
97	13	146	- 8.1	11.3	65.61	127.69	- 91.53
98	26	124	4.9	-10.7	24.01	114.49	- 52.43
99	21	1135	- .1	.3	.01	.09	- .03
100	29	174	7.2	39.3	51.84	1544.49	282.96
101	27	134	5.9	- .7	27.04	.49	- 4.13
102	18	112	- 3.1	-22.7	9.61	515.29	70.37
103	6	166	-15.1	31.3	228.01	979.69	-472.63
104	8	136	-13.1	1.3	171.61	1.69	- 17.03
105	23	1124	1.9	-10.7	3.61	114.49	- 20.33
106	13	1128	- 8.1	- 6.7	65.61	44.89	54.27
107	27	145	5.9	10.3	27.04	106.09	60.77
108	26	126	4.9	- 8.7	17.64	75.69	- 42.63
109	--	---	----	----	-----	-----	-----
110	20	148	- 1.1	13.3	1.21	176.89	- 14.63
111	22	89	.9	-45.7	.81	2088.49	- 41.13
112	14	181	- 7.1	46.3	50.41	2143.69	-328.73
113	29	146	7.9	11.3	62.41	127.69	89.27
114	30	134	8.9	- .7	79.21	.49	- 6.23
115	12	113	- 9.1	-21.7	82.81	470.89	197.47
116	13	104	- 8.1	-30.7	65.61	936.36	248.67
117	24	141	2.9	6.3	8.41	39.69	18.27
118	19	149	- 2.1	14.3	4.41	204.49	- 30.03
119	19	135	- 2.1	.3	4.41	.09	- .63
120	19	161	- 2.1	26.3	4.41	691.69	- 55.23
121	16	120	- 5.1	-14.7	26.01	216.09	74.97
122	23	174	1.9	39.3	1.21	1544.49	74.67
123	16	145	- 5.1	10.3	26.01	106.09	- 52.53
124	31	1196	9.9	61.3	98.01	3757.69	606.87
125	21	132	- .1	- 2.7	.01	7.29	.27
126	7	110	-14.1	-24.7	198.81	.630.09	348.27
127	13	143	- 8.1	8.3	65.61	68.89	- 67.23
128	30	166	8.9	31.3	79.21	979.69	278.57
129	18	147	- 3.1	12.3	9.61	151.29	- 38.13
130	23	118	1.9	-16.7	1.21	278.89	- 31.73
131	30	132	8.9	- 2.7	67.24	7.29	- 24.03
132	13	121	- 8.1	-13.7	65.61	187.69	110.97
133	30	149	8.9	14.3	79.21	204.49	127.27
134	29	113	7.9	-21.7	62.41	470.89	-171.43
135	30	151	8.9	16.3	79.21	265.69	145.07
136	30	161	8.9	26.3	79.21	691.69	234.07
137	29	144	7.9	9.3	62.41	86.49	73.47
138	29	128	7.9	- 6.7	62.41	44.89	- 52.93
139	4	108	-17.1	-26.7	292.41	712.89	456.57
140	30	150	8.9	15.3	79.21	234.09	136.17
141	30	144	8.9	9.3	79.21	86.49	82.77
142	29	156	7.9	21.3	62.41	453.69	169.27
143	2	124	-19.1	-10.7	364.81	114.49	204.37

TABLE IV a
(1933)

No.	X	Y	X	Y	X	Y
96	12	188	- 8.1	- 8.7	98.61	48.88
97	10	189	-11.1	14.5	128.61	89.44
98	13	140	- 8.1	11.3	98.61	128.61
99	86	184	4.9	-10.7	24.01	114.48
100	21	182	- 1.1	2.	.01	.00
101	29	174	7.3	39.8	51.84	184.48
102	27	184	5.9	7.	37.04	48.
103	16	112	- 2.1	-22.7	9.61	618.88
104	2	168	-12.1	21.3	888.01	278.88
105	8	128	-12.1	1.3	171.61	1.88
106	25	184	1.3	-10.7	3.61	114.48
107	13	188	- 8.1	- 8.7	68.61	44.88
108	27	140	5.9	10.3	37.04	108.00
109	26	128	4.9	- 8.7	19.64	72.88
110	--	--	--	--	--	--
111	20	148	- 1.1	13.3	1.21	178.88
112	22	88	9.	-45.7	.81	2088.48
113	14	161	- 7.1	48.3	50.41	2148.88
114	29	146	7.9	11.3	62.61	127.88
115	30	124	8.9	7.	79.21	48.
116	12	112	- 9.1	-21.7	82.81	470.88
117	12	104	- 8.1	-20.7	65.61	228.88
118	24	141	5.9	6.3	34.81	29.88
119	19	149	- 8.1	14.3	4.41	204.48
120	19	126	- 8.1	3.	4.41	.00
121	19	161	- 2.1	25.3	4.41	961.88
122	16	120	- 2.1	-14.7	36.01	318.00
123	25	174	1.9	39.3	1.21	1844.48
124	16	143	- 5.1	10.3	26.01	108.00
125	21	198	9.9	61.3	98.01	2727.68
126	21	128	- 1.	- 2.7	.01	7.28
127	7	110	-14.1	-24.7	196.81	680.00
128	12	143	- 8.1	8.3	65.61	88.88
129	20	168	8.9	21.3	79.21	978.88
130	16	147	- 2.1	12.3	4.81	161.28
131	20	128	8.9	- 2.7	87.24	7.28
132	12	121	- 8.1	-12.7	65.61	187.88
133	20	149	8.9	14.3	79.21	204.48
134	22	112	7.9	-21.7	62.41	470.88
135	20	161	8.9	16.3	79.21	268.88
136	20	181	8.9	28.3	79.21	621.88
137	22	144	7.9	9.3	62.41	88.88
138	29	128	7.9	- 8.7	62.41	44.88
139	4	108	-17.1	-22.7	288.41	718.88
140	20	120	- 8.9	18.3	79.21	204.48
141	20	144	8.9	9.3	79.21	88.88
142	29	126	7.9	21.3	62.41	488.88
143	2	124	-12.1	-10.7	304.81	114.48

TABLE IV a (1938)

No.	X	Y	x	y	x ²	y ²	xy
144	20	123	- 1.1	-11.7	1.21	136.89	12.87
145	25	124	3.9	-10.7	10.24	114.49	- 41.73
146	13	130	- 8.1	- 4.7	65.61	22.09	38.07
147	26	135	4.9	.3	17.64	.09	1.47
148	30	175	8.9	40.3	67.24	1624.09	358.67
149	10	100	-11.1	-34.7	123.21	1204.09	385.17
150	26	157	4.9	22.3	24.01	497.29	109.27
151	29	167	7.9	32.2	62.41	1043.29	255.17
152	16	135	- 5.1	.3	26.01	.09	- 1.53
153	22	141	.9	6.3	.81	39.69	5.67
154	21	121	- .1	-13.7	.01	187.69	1.37
155	30	181	8.9	46.3	67.24	2143.69	412.07
156	14	141	- 7.1	6.3	50.41	39.69	- 44.73
157	28	152	6.9	17.3	47.61	299.29	119.37
158	16	166	- 5.1	31.3	26.01	979.69	-159.63
159	28	115	6.9	-19.7	47.61	388.09	-135.93
160	20	156	- 1.1	21.3	1.21	453.69	- 23.43
161	8	142	-13.1	7.3	171.61	53.29	- 95.73
162	13	124	- 8.1	-10.7	65.61	114.49	86.67
163	20	134	- 1.1	- .7	1.21	.49	.77
164	19	125	- 2.1	- 9.7	4.41	94.09	20.37
165	20	129	- 1.1	- 5.7	1.21	32.49	6.27
166	28	132	6.9	- 2.7	47.61	7.29	- 18.63
167	29	102	7.9	-32.7	62.41	1069.29	-258.33
168	10	126	-11.1	- 8.7	123.21	75.69	96.57
169	14	133	- 7.1	- 1.7	50.41	2.89	12.07
170	14	150	- 7.1	15.3	50.41	234.09	-108.63
171	22	150	.9	15.3	.81	234.09	13.77
172	9	126	-12.1	- 8.7	146.41	68.89	105.27
173	25	106	3.9	-28.7	15.21	800.89	-111.93
174	22	149	.9	14.3	.81	204.49	12.87
175	19	144	- 2.1	9.3	4.41	86.49	- 19.53
176	16	132	- 5.1	- 2.7	26.01	7.29	13.77
177	19	124	- 2.1	-10.7	4.41	114.49	22.57
178	28	140	6.9	5.3	47.61	28.09	36.57
179	9	164	-12.1	29.3	146.41	858.49	-354.52
180	27	134	5.9	- .7	34.81	.49	- 4.13
181	22	154	.9	19.3	.81	372.49	17.37
182	28	123	6.9	-11.7	47.61	136.89	- 80.73
183	5	141	-16.1	6.3	285.61	39.69	-101.43
184	25	124	3.9	-10.7	15.21	114.49	- 41.73
185	20	150	- 1.1	15.3	1.21	234.09	- 16.83
186	25	125	3.9	- 9.7	15.21	94.09	- 37.83
187	29	134	7.9	- .7	62.41	.49	- 5.53
188	15	138	- 6.1	3.3	37.21	10.09	- 20.13
189	31	122	9.9	-12.7	98.01	161.29	-125.73
190	24	138	2.9	3.3	8.41	10.09	9.57
191	25	123	3.9	-11.7	15.21	136.89	- 45.63

TABLE IV a (1938)

No.	X	Y	X	Y	X	Y	X	Y
144	20	132	-1.1	-11.7	1.81	98.88	12.87	
145	22	134	2.2	-10.7	10.24	114.42	-41.73	
146	13	130	-8.1	-4.7	62.61	22.02	28.07	
147	22	132	4.2	2.	17.64	90.	1.47	
148	20	134	2.2	20.2	27.24	1224.02	22.87	
149	10	100	-11.1	-24.7	122.21	1204.02	122.17	
150	22	134	2.2	22.2	22.01	427.22	102.27	
151	22	134	2.2	22.2	22.01	1022.22	222.17	
152	16	132	-5.1	2.	22.01	90.	-1.22	
153	22	134	2.2	2.2	22.	22.22	2.27	
154	21	121	1.	-12.7	101	127.22	1.27	
155	20	121	2.2	22.2	27.24	212.22	212.07	
156	14	141	-7.1	2.2	20.41	22.22	-44.73	
157	22	132	2.2	17.2	47.61	222.22	112.27	
158	12	122	-2.1	21.2	22.01	222.22	-122.22	
159	22	112	2.2	-12.7	47.61	222.22	-122.22	
160	20	122	-1.1	21.2	1.21	222.22	-22.22	
161	2	142	-12.1	7.2	171.61	22.22	-22.27	
162	12	124	-2.1	-10.7	22.61	114.42	22.27	
163	20	124	-1.1	7.	1.21	22.	77.	
164	12	122	-2.1	2.2	4.41	24.02	20.27	
165	20	122	-1.1	2.7	1.21	22.42	2.27	
166	22	112	2.2	2.7	47.61	7.22	-12.22	
167	22	102	2.2	-22.7	22.21	1022.22	-222.22	
168	10	122	-11.1	-2.7	122.21	22.22	22.27	
169	14	122	-7.1	-1.7	20.41	2.22	12.07	
170	14	120	-7.1	12.2	20.41	224.02	-102.22	
171	22	120	2.	12.2	22.	224.02	11.77	
172	2	122	-12.1	-2.7	142.41	22.22	102.27	
173	22	102	2.2	-22.7	12.21	22.02	-11.27	
174	22	142	2.	12.2	22.	202.42	12.27	
175	12	142	-2.1	2.2	4.41	22.22	-12.22	
176	12	122	-2.1	2.7	22.01	7.22	12.77	
177	12	124	-2.1	-10.7	4.41	114.42	22.27	
178	22	140	2.2	2.2	47.61	22.02	20.27	
179	2	124	-12.1	22.2	142.41	22.22	-222.22	
180	27	124	2.2	2.	24.61	22.	-4.12	
181	22	122	2.	12.2	22.	222.22	17.27	
182	22	122	2.2	-11.7	47.61	122.22	-20.72	
183	2	141	-12.1	2.2	122.21	22.22	-101.42	
184	22	124	2.2	-10.7	12.21	114.42	-41.73	
185	20	120	-1.1	12.2	1.21	224.02	-12.22	
186	22	122	2.2	-2.7	12.21	22.02	-22.22	
187	22	124	2.2	2.	22.41	22.	-2.22	
188	12	122	-2.1	2.2	27.21	10.02	-20.12	
189	21	122	-12.1	22.7	22.01	121.22	-122.72	
190	24	122	2.2	2.2	2.41	10.02	2.27	
191	22	122	2.2	-11.7	12.21	122.22	-42.22	

TABLE IV a (1938)

No.	X	Y	x	y	x ²	y ²	xy
192	29	161	7.9	26.3	62.41	691.69	207.77
193	24	141	2.9	6.3	8.41	39.69	18.27
194	19	131	- 2.1	- 3.7	4.41	10.09	7.77
195	19	112	- 2.1	-22.7	4.41	515.29	47.67
196	29	137	7.9	2.3	62.41	5.29	18.17
197	19	170	- 2.1	35.3	4.41	1246.09	- 74.13
198	9	137	-12.1	2.3	146.41	5.29	110.67
199	16	113	- 5.1	-21.7	26.01	470.89	- 27.83
200	17	159	- 4.1	24.31	16.81	590.49	- 99.63
201	28	146	6.9	11.3	47.61	127.69	77.97
202	25	169	3.9	34.3	15.21	1176.49	133.77
203	25	148	3.9	13.3	15.21	176.89	51.87
204	19	139	- 2.1	4.3	4.41	18.49	- 9.03
205	30	144	8.9	9.3	79.21	86.49	82.77
206	22	131	.9	- 3.7	.81	13.69	- 3.33
207	33	132	11.9	- 2.7	141.61	7.29	- 32.13
208	26	128	4.9	- 6.7	24.01	44.89	- 32.83
209	21	149	- .1	14.3	.01	204.49	- 1.43
210	31	154	9.9	19.3	98.01	372.49	191.07
211	21	141	- .1	6.3	.01	39.69	- .63
212	27	171	5.9	36.3	34.81	1317.69	214.17
213	15	139	- 6.1	5.3	37.21	28.09	- 32.33
214	24	133	2.9	- 1.7	8.41	2.89	- 4.93
215	10	90	-11.1	-44.7	123.21	1998 .09	496.17
216	24	141	2.9	6.3	8.41	39.69	18.27
217	28	149	6.9	15.3	47.61	234.09	105.57
218	22	130	.9	- 4.7	.81	22.09	- 4.23
219	22	136	.9	1.3	.81	1.69	1.17
220	13	136	- 8.1	1.3	65.61	1.69	- 10.53
221	13	122	- 8.1	-12.7	65.61	161.29	102.87
222	22	148	.9	13.3	.89	176.89	11.97
223	19	147	- 2.1	12.3	4.41	151.29	- 25.83
224	17	107	- 4.1	-27.7	16.81	767.29	113.57
225	27	119	5.9	-15.7	34.81	246.49	- 92.63
226	30	135	8.9	.3	79.21	.09	2.67
227	7	110	-14.1	-24.7	198.81	610.09	348.27
228	16	142	- 5.1	7.3	26.01	53.29	- 37.23
229	32	161	10.9	26.3	118.81	691.69	286.67
230	29	143	7.9	8.3	62.41	68.89	65.57
231	27	157	5.9	22.3	34.81	497.29	131.57
232	30	119	8.9	-14.7	79.21	216.09	-130.83
233	24	135	2.9	.3	8.41	.09	.87
234	6	89	-15.1	-45.7	228.01	2088.49	690.07
235	22	154	.9	19.3	.81	372.49	17.37
236	25	99	3.9	-35.7	15.21	1274.49	-139.23
237	13	118	- 8.1	-16.7	65.61	278.89	135.27
238	18	92	- 3.1	-42.7	9.61	1823.29	132.37
239	17	134	- 4.1	- .7	16.81	.49	2.87

TABLE IV (1935)

80.	7	Y	X	Y	X	Y	8	7
192	89	181	7.9	80.2	14.41	89.189	207.77	77
193	84	141	8.9	8.2	14.41	89.207	18.27	78
194	19	131	- 2.1	- 2.7	14.41	89.10.00	7.77	79
195	19	112	- 2.1	- 23.7	14.41	89.013	47.87	80
196	89	107	7.9	2.2	14.41	89.013	11.17	81
197	19	170	- 2.1	20.2	14.41	89.00.00	31.47	82
198	9	127	- 12.1	2.3	14.41	89.013	110.67	83
199	16	112	- 2.1	- 21.7	14.41	89.013	28.27	84
200	17	129	- 4.1	24.2	14.41	89.013	29.27	85
201	28	142	6.9	11.2	14.41	89.013	77.27	86
202	23	129	2.9	24.2	14.41	89.013	122.77	87
203	23	128	2.9	12.2	14.41	89.013	21.27	88
204	19	129	- 2.1	4.2	14.41	89.013	9.00	89
205	20	142	6.9	2.2	14.41	89.013	22.27	90
206	22	121	9.	- 2.7	14.41	89.013	2.27	91
207	23	122	11.9	- 2.7	14.41	89.013	21.27	92
208	22	122	4.9	- 2.7	14.41	89.013	22.27	93
209	21	129	- 1.	14.2	14.41	89.013	1.42	94
210	21	124	9.9	19.2	14.41	89.013	101.07	95
211	21	121	- 1.	2.2	14.41	89.013	22.27	96
212	27	171	2.9	20.2	14.41	89.013	214.17	97
213	16	129	- 2.1	2.2	14.41	89.013	22.27	98
214	24	122	2.9	- 1.7	14.41	89.013	4.27	99
215	10	90	- 11.1	- 42.7	14.41	89.013	422.17	100
216	24	141	2.9	2.2	14.41	89.013	18.27	101
217	28	129	6.9	12.2	14.41	89.013	102.27	102
218	22	120	9.	- 4.7	14.41	89.013	4.27	103
219	22	122	9.	1.2	14.41	89.013	1.17	104
220	12	122	- 2.1	1.2	14.41	89.013	- 10.27	105
221	12	122	- 2.1	- 12.7	14.41	89.013	102.27	106
222	22	142	9.	12.2	14.41	89.013	11.27	107
223	19	147	- 2.1	12.2	14.41	89.013	- 22.27	108
224	17	107	- 4.1	- 27.7	14.41	89.013	112.27	109
225	27	119	2.9	- 12.7	14.41	89.013	- 22.27	110
226	20	122	6.9	2.	14.41	89.013	2.27	111
227	7	110	- 14.1	- 24.7	14.41	89.013	242.27	112
228	16	142	- 2.1	7.2	14.41	89.013	- 27.27	113
229	22	121	10.9	20.2	14.41	89.013	222.27	114
230	22	142	7.9	2.2	14.41	89.013	22.27	115
231	27	127	2.9	22.2	14.41	89.013	121.27	116
232	20	119	2.9	- 14.7	14.41	89.013	- 120.27	117
233	24	122	2.9	2.	14.41	89.013	2.27	118
234	2	89	- 12.1	- 42.7	14.41	89.013	202.07	119
235	22	124	9.	12.2	14.41	89.013	17.27	120
236	22	92	2.9	- 22.7	14.41	89.013	- 22.27	121
237	12	112	- 2.1	- 12.7	14.41	89.013	122.27	122
238	18	92	- 2.1	- 42.7	14.41	89.013	122.27	123
239	17	124	- 4.1	7.	14.41	89.013	2.27	124

TABLE IV a (1938)

No.	X	Y	x	y	x ²	y ²	xy
238					11687.53	97541.29	9479.53

21.1 134.72

Correlating :

$$\begin{aligned}
 r &= \frac{\sum xy}{\sqrt{\sum x^2} \times \sqrt{\sum y^2}} \\
 &= \frac{9479.53}{\sqrt{11687.53} \times \sqrt{97541.29}} = \frac{9479.53}{108.11 \times 312.31} \\
 &= \frac{9,479.53}{33,763.83} = .22
 \end{aligned}$$

$$\begin{aligned}
 P. E. &= \frac{.6745 \times (1-r^2)}{\sqrt{N}} \\
 &= \frac{.6745 \times (1-.0484)}{\sqrt{238}} \\
 &= \frac{.6745 \times .9516}{15.42} \\
 &= \frac{.6419}{15.42} = .0416
 \end{aligned}$$

TABLE IV a (1938)

No. X Y X Y X Y X Y

11887.83 3474.83 11887.83 3474.83

31.1 136.73

Correlating :

$$r = \frac{\sum xy}{\sqrt{\sum x^2} \times \sqrt{\sum y^2}}$$

$$= \frac{3474.83}{\sqrt{11887.83} \times \sqrt{11887.83}} = \frac{3474.83}{108.11 \times 108.11}$$

$$SS. = \frac{3474.83}{3474.83} =$$

$$P. E. = \frac{(S_T - 1) \times 3474.83}{\sqrt{n}}$$

$$= \frac{(3474.83 - 1) \times 3474.83}{\sqrt{3474.83}}$$

$$= \frac{3474.83 \times 3474.83}{15.45}$$

$$= \frac{3474.83}{15.45} =$$

TABLE IV b

Correlation Between Army Alpha Scores and
University of Iowa Algebra Placement Test Scores

X = Scores on Iowa Examination

Y = Army Alpha Scores

No.	X	Y	x	y	x ²	y ²	xy
37-1	19	138	-16.4	1.2	268.96	1.44	- 19.68
2	33	149	- 2.4	12.2	5.76	148.84	- 29.28
3	38	155	2.6	18.2	6.76	331.24	47.32
4	40	130	4.6	- 6.8	21.16	46.24	- 31.28
5	40	145	4.6	8.2	21.16	67.24	37.72
6	33	144	- 2.4	7.2	5.76	51.84	- 17.28
7	17	140	-18.4	3.2	338.56	10.24	- 58.88
8	27	145	- 8.4	8.2	70.56	67.24	- 68.88
9	27	137	- 8.4	.2	70.56	.04	- 1.68
10	21	135	-14.4	- 1.8	207.36	3.24	25.92
11	36	161	.6	24.2	.36	585.64	14.52
12	21	124	-14.4	-12.8	207.36	163.84	184.32
13	46	156	10.6	19.2	112.36	368.64	203.52
14	34	126	- 1.4	-10.8	1.96	116.64	15.12
15	51	163	15.6	26.2	243.36	686.44	408.72
16	25	135	-10.4	- 1.8	108.16	3.24	18.72
17	45	143	9.6	6.2	92.16	38.44	59.52
18	30	123	- 5.4	-13.8	29.16	190.44	74.52
19	29	118	- 6.4	-18.8	40.96	353.44	120.32
20	43	122	7.6	-13.8	57.76	190.44	-104.88
21	45	129	9.6	- 7.8	92.16	60.84	- 74.88
22	50	141	14.6	4.2	213.16	17.64	61.32
23	50	167	10.6	20.2	112.36	408.04	214.12
24	28	138	- 7.4	1.2	54.76	1.44	- 8.88
25	45	155	9.6	18.2	92.16	331.24	174.72
26	34	143	- 1.9	6.2	1.96	38.44	- 8.68
27	27	123	- 8.4	-13.8	70.56	190.44	115.92
28	35	140	- .4	3.2	.16	10.24	- 1.28
29	26	155	- 9.4	18.2	88.36	331.24	-171.08
30	34	137	- 1.4	.2	1.96	.04	- .28
31	24	127	-11.4	- 9.8	129.96	96.04	111.72
32	34	104	- 1.4	-32.8	1.96	1075.84	45.92
33	18	112	-17.4	-24.8	302.76	615.04	429.78
34	59	145	23.6	8.2	556.96	67.24	193.52
35	35	136	- .4	- .8	.16	.64	.32
36	38	129	2.6	- 7.8	6.76	60.84	- 20.28
37	42	126	6.6	-10.8	43.56	116.64	- 71.28
38	28	129	- 7.4	- 7.8	54.76	60.84	57.72
39	32	135	- 3.4	- 1.8	11.56	3.24	6.12
40	29	133	- 6.4	- 3.8	40.96	14.44	24.32
41	29	101	- 6.4	-21.8	40.96	475.24	139.52
42	38	146	2.6	9.2	6.76	84.64	23.92

TABLE IV b

Correlation Between Army Alpha Scores and
University of Iowa Algebra Placement Test Scores

X = Scores on Iowa Examination
Y = Army Alpha Scores

No.	X	Y	X	Y	X ²	Y ²	XY
27-1	19	138	-18.4	1.2	338.56	1.44	-19.68
2	35	149	-2.4	12.2	5.76	148.84	-29.28
3	38	155	5.6	18.2	31.36	331.24	47.32
4	40	130	4.6	-6.8	21.16	45.84	-31.28
5	40	145	4.6	8.2	21.16	67.24	37.72
6	35	144	-2.4	7.2	5.76	51.84	-17.28
7	17	140	-18.4	3.2	338.56	10.24	-58.88
8	27	145	-8.4	8.2	70.56	67.24	-68.88
9	27	157	-8.4	2	70.56	.04	-1.68
10	21	155	-14.4	-1.8	207.36	3.24	26.92
11	36	161	6	24.2	36	582.64	14.52
12	21	184	-14.4	-12.8	207.36	163.84	184.32
13	46	156	10.6	19.2	112.36	368.64	203.52
14	34	156	-1.4	-10.8	1.96	116.64	15.12
15	21	162	-12.6	22.2	158.76	488.44	408.72
16	25	135	-10.4	-1.8	108.16	3.24	18.72
17	46	145	9.6	8.2	92.16	68.44	75.28
18	30	153	-2.4	-12.8	5.76	160.44	31.28
19	29	118	-6.4	-18.8	40.96	352.44	120.32
20	42	122	7.6	-12.8	57.76	160.44	-104.88
21	45	159	8.6	-7.8	73.96	60.84	-74.88
22	50	141	14.6	4.2	213.16	17.64	61.32
23	50	167	10.6	20.2	112.36	408.04	214.12
24	28	138	-7.4	1.2	54.76	1.44	-8.28
25	45	155	9.6	18.2	92.16	331.24	174.72
26	34	145	-1.9	6.2	3.61	38.44	-8.88
27	27	155	-8.4	-12.8	70.56	160.44	112.92
28	35	140	4	2.2	16	10.24	-1.28
29	26	155	-9.4	18.2	88.36	331.24	-171.08
30	34	157	-1.4	2	1.96	.04	-1.28
31	24	127	-11.4	-9.8	129.96	96.04	111.72
32	24	104	-1.4	-22.8	1.96	1065.84	45.92
33	18	118	-17.6	-24.8	308.76	615.04	439.78
34	29	145	22.6	8.2	506.76	67.24	193.52
35	35	136	4	-8	16	.64	-32
36	38	129	6.6	-7.8	43.56	60.84	-50.98
37	48	156	16.6	-10.8	275.56	116.64	-71.28
38	28	129	-7.4	-7.8	54.76	60.84	57.72
39	32	135	-3.4	-1.8	11.56	3.24	6.12
40	28	123	-6.4	-2.8	40.96	14.44	24.32
41	29	101	-6.4	-21.8	40.96	475.24	139.52
42	58	146	2.6	2.2	6.76	84.64	52.92

TABLE IV b

No.	X	Y	x	y	x^2	y^2	xy
43	43	135	7.6	- 1.8	57.76	3.24	- 13.68
44	41	181	5.6	44.2	31.36	1953.64	247.52
45	51	175	15.6	38.2	243.36	1459.24	595.92
46	36	146	.6	9.2	.36	84.64	5.52
47	31	104	- 4.4	-32.8	19.36	1075.84	144.32
48	27	129	- 8.4	- 7.8	70.56	60.84	65.52
49	41	134	5.6	- 2.8	31.36	7.84	- 15.68
50	23	113	-12.4	-23.8	153.76	566.44	295.12
51	--	---	----	----	----	-----	-----
52	47	138	11.6	1.2	134.56	1.44	13.92
53	16	119	-19.4	-17.8	376.36	316.84	345.32
54	26	132	- 9.4	- 4.8	88.36	23.04	45.12
55	40	143	4.6	6.2	21.16	38.44	28.52
56	46	149	10.6	12.2	112.36	148.84	129.32
57	35	119	- .4	-17.8	.16	316.84	7.12
58	32	127	- 3.4	- 9.8	11.56	96.04	33.32
59	42	147	6.6	10.2	43.56	104.04	67.32
60	21	138	-14.4	1.2	207.36	1.44	- 17.28
61	41	128	5.6	- 8.8	31.36	77.44	- 49.28
62	56	145	20.6	8.2	424.36	67.24	168.92
63	41	146	5.6	9.2	31.36	84.64	51.52
64	40	153	4.6	16.2	21.16	262.44	74.52
65	--	---	----	----	----	-----	-----
66	16	111	-19.4	-25.8	376.36	665.64	500.52
67	41	109	5.6	-27.8	31.36	772.84	-155.68
68	48	153	12.6	16.2	158.76	262.44	204.12
69	50	149	14.6	12.2	213.16	148.84	178.12
70	47	156	11.6	19.2	134.56	368.64	222.72
71	15	114	-20.4	-22.8	416.16	519.84	465.12
72	35	146	- .4	9.2	.16	84.64	- 3.68
73	32	128	- 3.4	- 8.8	11.56	77.44	29.92
74	49	175	13.6	38.2	184.96	1459.24	520.88
75	59	143	23.6	6.2	556.96	38.44	146.32
76	49	169	13.6	32.2	184.96	1036.84	437.92
77	33	89	- 2.4	-47.8	5.76	2284.84	114.72
78	48	155	12.6	18.2	158.76	331.24	229.32
79	47	176	11.6	39.2	134.56	1536.64	454.72
80	32	130	- 3.4	- 6.8	11.56	46.24	23.12
81	13	86	-22.4	-50.8	501.76	2580.64	1137.92
82	19	128	-16.4	- 8.8	268.96	77.44	144.32
83	44	138	8.6	1.2	73.96	1.44	10.32
84	19	135	-16.4	- 1.8	268.96	3.24	29.52
85	41	130	5.6	- 6.8	31.36	46.24	- 38.08
86	50	114	14.6	-22.8	213.16	519.84	-332.88
87	47	137	11.6	.2	134.56	.04	2.32
88	20	123	-15.4	-13.8	237.16	190.44	212.52
89	28	134	- 7.4	- 2.8	54.76	7.84	20.72
90	44	153	8.6	16.2	73.96	262.44	139.32

TABLE IV

No.	X	Y	X	Y	X	Y	X
30	44	133	8.8	18.8	73.36	868.44	139.38
31	38	134	-7.8	-13.8	64.76	7.84	80.76
32	38	134	-7.8	-13.8	64.76	7.84	80.76
33	44	137	8.8	11.8	134.56	1.04	85.8
34	44	137	8.8	11.8	134.56	1.04	85.8
35	44	137	8.8	11.8	134.56	1.04	85.8
36	44	137	8.8	11.8	134.56	1.04	85.8
37	44	137	8.8	11.8	134.56	1.04	85.8
38	44	137	8.8	11.8	134.56	1.04	85.8
39	44	137	8.8	11.8	134.56	1.04	85.8
40	44	137	8.8	11.8	134.56	1.04	85.8
41	44	137	8.8	11.8	134.56	1.04	85.8
42	44	137	8.8	11.8	134.56	1.04	85.8
43	44	137	8.8	11.8	134.56	1.04	85.8
44	44	137	8.8	11.8	134.56	1.04	85.8
45	44	137	8.8	11.8	134.56	1.04	85.8
46	44	137	8.8	11.8	134.56	1.04	85.8
47	44	137	8.8	11.8	134.56	1.04	85.8
48	44	137	8.8	11.8	134.56	1.04	85.8
49	44	137	8.8	11.8	134.56	1.04	85.8
50	44	137	8.8	11.8	134.56	1.04	85.8
51	44	137	8.8	11.8	134.56	1.04	85.8
52	44	137	8.8	11.8	134.56	1.04	85.8
53	44	137	8.8	11.8	134.56	1.04	85.8
54	44	137	8.8	11.8	134.56	1.04	85.8
55	44	137	8.8	11.8	134.56	1.04	85.8
56	44	137	8.8	11.8	134.56	1.04	85.8
57	44	137	8.8	11.8	134.56	1.04	85.8
58	44	137	8.8	11.8	134.56	1.04	85.8
59	44	137	8.8	11.8	134.56	1.04	85.8
60	44	137	8.8	11.8	134.56	1.04	85.8
61	44	137	8.8	11.8	134.56	1.04	85.8
62	44	137	8.8	11.8	134.56	1.04	85.8
63	44	137	8.8	11.8	134.56	1.04	85.8
64	44	137	8.8	11.8	134.56	1.04	85.8
65	44	137	8.8	11.8	134.56	1.04	85.8
66	44	137	8.8	11.8	134.56	1.04	85.8
67	44	137	8.8	11.8	134.56	1.04	85.8
68	44	137	8.8	11.8	134.56	1.04	85.8
69	44	137	8.8	11.8	134.56	1.04	85.8
70	44	137	8.8	11.8	134.56	1.04	85.8
71	44	137	8.8	11.8	134.56	1.04	85.8
72	44	137	8.8	11.8	134.56	1.04	85.8
73	44	137	8.8	11.8	134.56	1.04	85.8
74	44	137	8.8	11.8	134.56	1.04	85.8
75	44	137	8.8	11.8	134.56	1.04	85.8
76	44	137	8.8	11.8	134.56	1.04	85.8
77	44	137	8.8	11.8	134.56	1.04	85.8
78	44	137	8.8	11.8	134.56	1.04	85.8
79	44	137	8.8	11.8	134.56	1.04	85.8
80	44	137	8.8	11.8	134.56	1.04	85.8
81	44	137	8.8	11.8	134.56	1.04	85.8
82	44	137	8.8	11.8	134.56	1.04	85.8
83	44	137	8.8	11.8	134.56	1.04	85.8
84	44	137	8.8	11.8	134.56	1.04	85.8
85	44	137	8.8	11.8	134.56	1.04	85.8
86	44	137	8.8	11.8	134.56	1.04	85.8
87	44	137	8.8	11.8	134.56	1.04	85.8
88	44	137	8.8	11.8	134.56	1.04	85.8
89	44	137	8.8	11.8	134.56	1.04	85.8
90	44	137	8.8	11.8	134.56	1.04	85.8

TABLE IV b

No.	X	Y	x	y	x ²	y ²	xy
91	40	153	4.6	16.2	21.16	262.44	74.52
92	16	145	-19.4	8.2	376.36	67.24	-159.08
93	22	90	-13.4	-46.8	179.56	2190.24	627.12
94	22	114	-13.4	-22.8	179.56	519.84	305.52
95	41	161	5.6	24.2	31.36	585.64	135.52
96	28	109	-6.4	-27.8	40.96	772.84	177.92
97	22	142	-13.4	5.2	179.56	27.04	-69.68
98	35	153	- .4	16.2	.16	262.44	-6.48
99	32	145	-3.4	8.2	11.56	67.24	-27.88
100	36	164	.6	27.2	.36	739.84	16.32
101	25	122	-10.4	-14.8	108.16	219.04	153.92
102	43	163	7.6	26.2	57.76	686.44	199.12
103	22	132	-13.4	-4.8	179.56	23.04	64.32
104	47	125	11.6	-11.8	134.56	139.24	-136.88
105	38	156	2.6	19.2	6.76	368.64	49.92
106	24	150	-11.4	13.2	129.96	174.24	-150.48
107	23	126	-12.4	-10.8	153.76	116.64	133.92
108	40	137	4.6	.2	21.16	.04	.92
109	34	156	-1.4	19.2	1.96	368.64	-26.88
110	28	169	-7.4	32.2	54.76	1036.84	-238.28
111	43	141	7.6	4.2	57.76	17.64	31.92
112	34	108	-1.4	-28.8	1.96	829.44	40.32
113	48	131	12.6	-5.8	158.76	33.64	-73.08
114	49	152	13.6	15.2	184.96	231.04	206.72
115	46	149	.6	12.2	.36	148.84	7.32
116	44	127	8.6	-9.8	73.96	96.04	-84.28
117	31	160	-4.4	23.2	19.36	538.24	-102.08
118	49	162	13.6	25.2	184.96	635.04	342.72
119	42	147	6.6	10.2	43.56	104.04	67.32
120	32	156	-3.4	19.2	11.56	368.64	-65.28
121	38	124	2.6	-12.8	6.76	163.84	-33.28
122	13	104	-22.4	-32.8	501.76	1075.84	734.72
123	44	130	8.6	-6.8	73.96	46.24	-58.48
124	28	120	-7.4	-16.8	54.76	282.24	124.32
125	42	140	6.6	3.2	43.56	10.24	21.12
126	35	158	- .4	21.2	.16	449.44	-8.48
127	56	147	20.6	10.6	424.26	104.04	210.12
128	39	131	3.6	-5.8	12.96	33.64	-20.88
129	48	111	12.6	-25.8	158.76	665.64	-325.08
130	39	180	3.6	43.2	12.96	1866.24	155.52
131	21	134	-14.4	-2.8	207.36	7.84	40.32
132	55	160	19.6	23.2	384.16	538.24	454.72
133	27	117	-8.4	-19.8	70.56	392.04	166.32
134	45	132	9.6	-4.8	92.16	23.04	-46.08
135	31	133	-4.4	-3.8	19.36	14.44	16.72
136	39	135	3.6	-1.8	12.96	3.24	-6.48
137	24	147	-11.4	10.2	129.96	104.04	-116.28
138	27	131	-8.4	-5.8	70.56	33.64	48.72

TABLE IV b

No.	X	Y	X	Y	X	Y	X	Y
128	27	131	- 8.4	- 2.8	70.25	32.24	48.78	128
129	24	127	- 8.4	- 11.4	10.8	104.04	-118.28	129
130	38	180	3.6	43.2	12.95	168.84	122.22	130
131	31	134	-14.4	- 2.8	207.25	7.84	48.22	131
132	25	120	12.6	-22.8	128.75	66.84	-322.08	132
133	38	131	3.6	- 2.8	12.95	32.24	- 20.98	133
134	42	122	9.6	- 4.8	92.12	23.04	- 44.08	134
135	31	123	- 4.4	- 3.6	12.25	14.44	16.75	135
136	39	125	3.6	- 1.8	12.95	3.24	- 6.48	136
137	24	127	- 8.4	-11.4	10.8	104.04	-118.28	137
138	27	131	- 8.4	- 2.8	70.25	32.24	48.78	138
139	25	120	12.6	-22.8	128.75	66.84	-322.08	139
140	38	131	3.6	- 2.8	12.95	32.24	- 20.98	140
141	42	122	9.6	- 4.8	92.12	23.04	- 44.08	141
142	31	123	- 4.4	- 3.6	12.25	14.44	16.75	142
143	39	125	3.6	- 1.8	12.95	3.24	- 6.48	143
144	24	127	- 8.4	-11.4	10.8	104.04	-118.28	144
145	27	131	- 8.4	- 2.8	70.25	32.24	48.78	145
146	25	120	12.6	-22.8	128.75	66.84	-322.08	146
147	38	131	3.6	- 2.8	12.95	32.24	- 20.98	147
148	42	122	9.6	- 4.8	92.12	23.04	- 44.08	148
149	31	123	- 4.4	- 3.6	12.25	14.44	16.75	149
150	39	125	3.6	- 1.8	12.95	3.24	- 6.48	150
151	24	127	- 8.4	-11.4	10.8	104.04	-118.28	151
152	27	131	- 8.4	- 2.8	70.25	32.24	48.78	152
153	25	120	12.6	-22.8	128.75	66.84	-322.08	153
154	38	131	3.6	- 2.8	12.95	32.24	- 20.98	154
155	42	122	9.6	- 4.8	92.12	23.04	- 44.08	155
156	31	123	- 4.4	- 3.6	12.25	14.44	16.75	156
157	39	125	3.6	- 1.8	12.95	3.24	- 6.48	157
158	24	127	- 8.4	-11.4	10.8	104.04	-118.28	158
159	27	131	- 8.4	- 2.8	70.25	32.24	48.78	159
160	25	120	12.6	-22.8	128.75	66.84	-322.08	160
161	38	131	3.6	- 2.8	12.95	32.24	- 20.98	161
162	42	122	9.6	- 4.8	92.12	23.04	- 44.08	162
163	31	123	- 4.4	- 3.6	12.25	14.44	16.75	163
164	39	125	3.6	- 1.8	12.95	3.24	- 6.48	164
165	24	127	- 8.4	-11.4	10.8	104.04	-118.28	165
166	27	131	- 8.4	- 2.8	70.25	32.24	48.78	166
167	25	120	12.6	-22.8	128.75	66.84	-322.08	167
168	38	131	3.6	- 2.8	12.95	32.24	- 20.98	168
169	42	122	9.6	- 4.8	92.12	23.04	- 44.08	169
170	31	123	- 4.4	- 3.6	12.25	14.44	16.75	170
171	39	125	3.6	- 1.8	12.95	3.24	- 6.48	171
172	24	127	- 8.4	-11.4	10.8	104.04	-118.28	172
173	27	131	- 8.4	- 2.8	70.25	32.24	48.78	173
174	25	120	12.6	-22.8	128.75	66.84	-322.08	174
175	38	131	3.6	- 2.8	12.95	32.24	- 20.98	175
176	42	122	9.6	- 4.8	92.12	23.04	- 44.08	176
177	31	123	- 4.4	- 3.6	12.25	14.44	16.75	177
178	39	125	3.6	- 1.8	12.95	3.24	- 6.48	178
179	24	127	- 8.4	-11.4	10.8	104.04	-118.28	179
180	27	131	- 8.4	- 2.8	70.25	32.24	48.78	180
181	25	120	12.6	-22.8	128.75	66.84	-322.08	181
182	38	131	3.6	- 2.8	12.95	32.24	- 20.98	182
183	42	122	9.6	- 4.8	92.12	23.04	- 44.08	183
184	31	123	- 4.4	- 3.6	12.25	14.44	16.75	184
185	39	125	3.6	- 1.8	12.95	3.24	- 6.48	185
186	24	127	- 8.4	-11.4	10.8	104.04	-118.28	186
187	27	131	- 8.4	- 2.8	70.25	32.24	48.78	187
188	25	120	12.6	-22.8	128.75	66.84	-322.08	188
189	38	131	3.6	- 2.8	12.95	32.24	- 20.98	189
190	42	122	9.6	- 4.8	92.12	23.04	- 44.08	190
191	31	123	- 4.4	- 3.6	12.25	14.44	16.75	191
192	39	125	3.6	- 1.8	12.95	3.24	- 6.48	192
193	24	127	- 8.4	-11.4	10.8	104.04	-118.28	193
194	27	131	- 8.4	- 2.8	70.25	32.24	48.78	194
195	25	120	12.6	-22.8	128.75	66.84	-322.08	195
196	38	131	3.6	- 2.8	12.95	32.24	- 20.98	196
197	42	122	9.6	- 4.8	92.12	23.04	- 44.08	197
198	31	123	- 4.4	- 3.6	12.25	14.44	16.75	198
199	39	125	3.6	- 1.8	12.95	3.24	- 6.48	199
200	24	127	- 8.4	-11.4	10.8	104.04	-118.28	200
201	27	131	- 8.4	- 2.8	70.25	32.24	48.78	201
202	25	120	12.6	-22.8	128.75	66.84	-322.08	202
203	38	131	3.6	- 2.8	12.95	32.24	- 20.98	203
204	42	122	9.6	- 4.8	92.12	23.04	- 44.08	204
205	31	123	- 4.4	- 3.6	12.25	14.44	16.75	205
206	39	125	3.6	- 1.8	12.95	3.24	- 6.48	206
207	24	127	- 8.4	-11.4	10.8	104.04	-118.28	207
208	27	131	- 8.4	- 2.8	70.25	32.24	48.78	208
209	25	120	12.6	-22.8	128.75	66.84	-322.08	209
210	38	131	3.6	- 2.8	12.95	32.24	- 20.98	210
211	42	122	9.6	- 4.8	92.12	23.04	- 44.08	211
212	31	123	- 4.4	- 3.6	12.25	14.44	16.75	212
213	39	125	3.6	- 1.8	12.95	3.24	- 6.48	213
214	24	127	- 8.4	-11.4	10.8	104.04	-118.28	214
215	27	131	- 8.4	- 2.8	70.25	32.24	48.78	215
216	25	120	12.6	-22.8	128.75	66.84	-322.08	216
217	38	131	3.6	- 2.8	12.95	32.24	- 20.98	217
218	42	122	9.6	- 4.8	92.12	23.04	- 44.08	218
219	31	123	- 4.4	- 3.6	12.25	14.44	16.75	219
220	39	125	3.6	- 1.8	12.95	3.24	- 6.48	220
221	24	127	- 8.4	-11.4	10.8	104.04	-118.28	221
222	27	131	- 8.4	- 2.8	70.25	32.24	48.78	222
223	25	120	12.6	-22.8	128.75	66.84	-322.08	223
224	38	131	3.6	- 2.8	12.95	32.24	- 20.98	224
225	42	122	9.6	- 4.8	92.12	23.04	- 44.08	225
226	31	123	- 4.4	- 3.6	12.25	14.44	16.75	226
227	39	125	3.6	- 1.8	12.95	3.24	- 6.48	227
228	24	127	- 8.4	-11.4	10.8	104.04	-118.28	228
229	27	131	- 8.4	- 2.8	70.25	32.24	48.78	229
230	25	120	12.6	-22.8	128.75	66.84	-322.08	230
231	38	131	3.6	- 2.8	12.95	32.24	- 20.98	231
232	42	122	9.6	- 4.8	92.12	23.04	- 44.08	232
233	31	123	- 4.4	- 3.6	12.25	14.44	16.75	233
234	39	125	3.6	- 1.8	12.95	3.24	- 6.48	234
235	24	127	- 8.4	-11.4	10.8	104.04	-118.28	235
236	27	131	- 8.4	- 2.8	70.25	32.24	48.78	236
237	25	120	12.6	-22.8	128.75	66.84	-322.08	237
238	38	131	3.6	- 2.8	12.95	32.24	- 20.98	238
239	42	122	9.6	- 4.8	92.12	23.04	- 44.08	239
240	31	123	- 4.4	- 3.6	12.25	14.44	16.75	240
241	39	125	3.6	- 1.8	12.95	3.24	- 6.48	241
242	24	127	- 8.4	-11.4	10.8	104.04	-118.28	242
243	27	131	- 8.4	- 2.8	70.25	32.24	48.78	243
244	25	120	12.6	-22.8	128.75	66.84	-322.08	244
245	38	131	3.6	- 2.8	12.95	32.24	- 20.98	245
246	42	122	9.6	- 4.8	92.12	23.04	- 44.08	246
247	31	123	- 4.4	- 3.6	12.25	14.44	16.75	247
248	39	125	3.6	- 1.8	12.95	3.24	- 6.48	248
249	24	127	- 8.4	-11.4	10.8	104.04	-118.28	249
250	27	131	- 8.4	- 2.8	70.25	32.24	48.78	250

TABLE IV b

No.	X	Y	x	y	x^2	y^2	xy
139	28	99	- 7.4	-37.8	54.76	1428.84	279.72
140	29	117	- 6.4	-19.8	40.96	392.04	126.72
141	33	133	- 2.4	- 3.8	5.76	14.44	9.12
142	39	149	3.6	12.26	12.96	148.84	43.92
143	37	141	1.6	4.2	2.56	17.64	6.72
144	39	136	3.6	- .8	12.96	.64	- 2.88
145	43	120	7.6	-16.8	57.76	282.24	-127.68
146	54	163	18.6	26.2	345.96	686.44	487.32
147	32	76	- 3.4	-60.8	11.56	3696.64	206.72
148	34	137	- 1.4	.2	1.96	.04	- .28
149	22	109	-13.4	-27.8	179.56	772.84	372.52
150	38	179	2.6	42.2	6.76	1780.84	109.72
151	60	142	24.6	5.2	605.16	27.04	127.92
152	43	146	7.6	9.2	57.76	84.64	69.92
153	35	136	- .4	- .8	.16	.64	.32
154	47	146	11.6	9.2	134.56	84.64	106.72
155	37	124	1.6	-12.8	2.56	163.84	- 20.48
156	38	150	2.6	13.2	6.76	174.24	34.32
157	49	168	13.6	31.2	184.96	973.44	424.32
158	24	109	-11.4	-29.8	129.96	888.04	339.72
159	43	141	7.6	4.2	57.76	17.64	31.92
160	27	156	- 8.4	19.2	70.56	368.64	-161.28
161	41	138	5.6	1.2	31.36	1.44	6.72
162	38	111	2.6	-25.8	6.76	665.64	- 67.08
163	37	141	1.6	4.2	2.56	17.64	6.72
164	27	159	- 8.4	22.2	70.56	492.84	-186.48
165	25	145	-10.4	8.2	108.16	67.24	- 85.28
166	42	129	6.6	- 7.8	43.56	60.84	- 51.84
167	12	127	-23.4	- 9.8	547.56	96.04	229.32
168	61	186	25.6	49.2	655.36	2420.64	1259.52
169	29	136	- 6.4	- .8	40.96	.64	5.12
170	35	119	- .4	-17.8	.16	316.84	7.12
171	32	119	- 3.4	-17.8	11.56	316.84	60.52
172	43	141	7.6	4.2	57.76	17.64	31.92
173	15	75	-20.4	-61.8	416.16	3819.24	1260.72
174	36	140	.6	3.2	.36	10.24	1.92
175	54	175	18.6	38.2	345.96	1459.24	710.52
176	45	154	9.6	17.2	92.16	259.84	165.12
177	63	175	27.6	38.2	761.76	1459.24	1054.32
178	30	123	- 5.4	-13.8	29.16	190.44	74.52
179	50	176	14.6	39.2	213.16	1536.64	572.32
180	31	122	- 4.4	-14.8	19.36	219.04	65.12
181	37	134	1.6	- 2.8	2.56	7.84	- 4.48
182	42	137	6.6	.2	43.56	.04	1.32
183	48	171	12.6	34.2	158.76	1169.64	430.92
184	39	126	3.6	-10.8	12.96	116.64	- 38.88
185	33	114	- 2.4	-22.8	5.76	519.84	54.72
186	34	153	- 1.4	16.2	1.96	262.44	- 22.68

TABLE IV b

No.	X	Y	X	Y	X	Y	X	Y
139	38	99	- 7.4	-37.8	34.78	1438.84	37.97	379.73
140	38	117	- 8.4	-19.8	40.98	338.04	38.78	138.78
141	38	123	- 8.4	- 8.8	3.78	14.44	31.8	9.18
142	39	149	8.8	18.8	18.98	148.84	43.98	43.98
143	37	141	4.8	1.8	3.38	17.84	8.73	8.73
144	39	138	8.8	- 8.8	13.98	34	8.88	- 8.88
145	45	150	7.8	-18.8	37.78	383.84	-137.88	-137.88
146	40	183	18.8	38.8	383.88	383.88	487.88	487.88
147	38	76	- 3.4	-60.8	11.88	338.84	338.73	338.73
148	34	137	- 1.4	- 8.8	1.38	34	88	- 88
149	38	109	-13.4	-37.8	139.88	773.84	373.88	373.88
150	38	179	8.8	48.8	87.8	1780.84	109.73	109.73
151	60	148	24.8	34.8	603.18	37.04	187.98	187.98
152	43	148	7.8	3.8	37.78	84.84	89.98	89.98
153	33	138	- 4	- 8	18	34	38	38
154	47	148	11.8	2.8	134.38	84.84	104.73	104.73
155	37	184	1.8	-18.8	9.88	183.84	- 80.88	- 80.88
156	38	180	8.8	13.8	8.78	174.84	34.38	34.38
157	49	188	18.8	51.8	184.88	973.44	484.38	484.38
158	34	109	-11.4	-39.8	189.88	40.84	338.73	338.73
159	43	141	7.8	4.8	37.78	17.84	31.98	31.98
160	37	138	- 4.4	19.8	70.88	388.84	-161.88	-161.88
161	41	138	8.8	1.8	31.38	1.44	8.73	8.73
162	38	111	8.8	-38.8	8.78	883.84	- 87.08	- 87.08
163	37	141	1.8	4.8	3.38	17.84	37.8	37.8
164	37	139	- 8.4	38.8	70.88	493.84	-184.48	-184.48
165	33	148	-10.4	8.8	108.18	67.84	- 83.88	- 83.88
166	43	183	8.8	- 7.8	43.38	80.84	- 81.84	- 81.84
167	18	137	-33.4	- 8.8	347.88	98.04	338.38	338.38
168	81	188	85.8	49.8	838.38	3480.84	1889.88	1889.88
169	39	138	- 8.4	40.88	40.88	34	31.8	31.8
170	38	119	- 4	-17.8	11	318.84	7.18	7.18
171	38	119	- 3.4	-17.8	17.88	318.84	80.88	80.88
172	43	141	7.8	4.8	37.78	17.84	99.18	99.18
173	18	78	-30.4	-61.8	418.18	3818.84	1880.73	1880.73
174	38	140	8	3.8	38	10.84	1.88	1.88
175	84	178	18.8	38.8	848.88	1483.84	970.38	970.38
176	48	184	9.8	17.8	98.18	338.84	183.18	183.18
177	63	178	37.8	78.8	781.88	1438.84	1034.38	1034.38
178	30	183	- 8.4	-18.8	31.88	130.44	74.38	74.38
179	30	178	14.8	38.8	318.18	1338.84	878.38	878.38
180	31	183	- 4.4	-14.8	19.88	318.04	89.18	89.18
181	37	134	1.8	- 8.8	8.38	7.84	4.48	- 4.48
182	48	137	8.8	3.8	48.38	10.84	1.38	1.38
183	48	171	18.8	34.8	188.78	1183.84	430.88	430.88
184	39	188	3.8	-10.8	18.88	118.84	- 38.88	- 38.88
185	38	114	- 8.4	-38.8	3.78	318.84	84.73	84.73
186	34	123	- 1.4	18.8	1.38	388.44	- 33.88	- 33.88

TABLE IV b

No.	X	Y	x	y	x ²	y ²	xy
187							
187	55	163	19.6	26.2	384.16	686.44	513.52
188	46	167	10.6	30.2	112.36	912.04	320.12
189	44	128	8.6	- 8.8	73.96	77.44	- 75.68
190	59	191	23.6	54.2	556.96	2937.64	1279.12
191	44	133	8.6	- 3.8	73.96	14.44	- 32.68
192	21	146	-14.4	9.2	207.36	84.64	- 132.48
193	7	84	-28.4	-52.8	806.56	2787.84	1499.52
194	48	126	12.6	-10.8	158.76	116.64	- 136.08
195	34	136	- 1.4	- .8	1.96	.64	1.12
196	31	124	- 4.4	-12.8	19.36	163.84	56.32
197	25	127	-10.4	- 9.8	108.16	96.04	101.92
198	36	146	.6	9.2	.36	84.64	5.52
199	38	140	2.6	3.2	6.76	10.24	8.32
200	34	155	- 1.4	18.2	1.96	331.24	- 25.48
201	14	102	-21.4	-34.8	457.96	1211.04	744.72
202	39	121	3.6	-15.8	12.96	249.64	- 56.88
203	37	150	1.6	13.2	2.56	174.24	21.12
204	43	160	7.6	23.2	57.76	538.24	176.32
205	34	139	- 1.4	2.2	1.96	4.84	- 3.08
206	24	121	-11.4	-15.8	129.96	249.64	180.12
207	46	151	10.6	14.2	112.36	201.64	150.52
208	13	140	-22.4	3.2	501.76	10.24	- 71.68
209	40	160	4.6	23.2	21.16	538.24	106.72
210	37	171	1.6	34.2	2.56	1169.64	54.72
211	28	120	- 7.4	-16.8	54.76	282.24	124.32
212	36	122	.6	-14.8	.36	219.04	- 8.88
213	46	133	10.6	- 3.8	112.36	14.44	- 40.28
214	32	130	- 3.4	- 6.8	11.56	46.24	23.12
215	36	176	.6	39.2	.36	1536.64	23.52
216	34	126	- 1.4	-10.8	1.96	116.64	15.12
217	15	141	-20.4	4.2	416.16	17.64	- 85.68
218	53	190	17.6	53.2	309.76	2830.24	936.32
219	26	134	- 9.4	- 2.8	88.36	7.84	26.32
220	52	169	16.6	32.2	275.56	1036.84	534.52
221	36	129	.6	- 7.8	.36	60.84	- 4.68
222	35	164	- .4	27.2	.16	739.84	- 10.88
223	24	106	-11.4	-30.8	129.96	948.64	351.12
224	37	133	1.6	- 3.8	2.56	14.44	- 6.08
225	25	134	-10.4	- 2.8	108.16	7.84	29.12
226	19	105	-16.4	-31.8	268.96	1011.24	521.52
227	48	158	12.6	21.2	158.76	449.44	267.12
228	57	178	21.6	41.2	466.56	1697.44	889.92
229	17	88	-18.4	-48.8	338.56	2381.44	897.92
230	51	175	15.6	38.2	243.36	1459.24	595.92
231	46	159	10.6	22.2	112.36	492.84	235.32
232	27	144	- 8.4	7.2	70.56	51.84	- 60.48
233	59	184	23.6	47.2	556.96	2227.84	1113.92
234	30	111	- 5.4	-25.8	29.16	665.64	139.32

TABLE IV b

No.	X	Y	X	Y	X	Y	X ²	Y ²	XY
187	30	111	-32.8	52.16	32.16	52.16	1036.36	2721.12	-1680.00
188	32	104	-30.8	47.44	30.8	47.44	948.64	2251.12	-1464.00
189	37	144	-25.8	66.49	25.8	66.49	665.64	4460.76	-1708.00
190	46	133	-16.8	282.24	16.8	282.24	282.24	3732.49	-4782.00
191	44	133	-18.8	275.84	18.8	275.84	353.44	3732.49	-5184.00
192	31	142	-31.8	493.64	31.8	493.64	1011.24	7058.76	-12528.00
193	7	34	-32.8	111.84	32.8	111.84	1074.24	128.96	-3664.00
194	48	132	-13.8	188.64	13.8	188.64	190.44	1849.44	-1896.00
195	34	132	-17.8	317.64	17.8	317.64	317.64	1849.44	-2342.40
196	31	124	-20.8	426.24	20.8	426.24	432.64	1536.64	-2684.80
197	32	127	-19.8	392.04	19.8	392.04	392.04	1584.64	-2515.20
198	36	142	-15.8	249.64	15.8	249.64	249.64	1764.64	-2390.40
199	38	140	-13.8	188.64	13.8	188.64	190.44	1764.64	-2184.00
200	34	122	-17.8	317.64	17.8	317.64	317.64	1584.64	-2342.40
201	14	102	-34.8	1211.04	34.8	1211.04	1211.04	1411.04	-4819.20
202	32	121	-18.8	353.44	18.8	353.44	353.44	1764.64	-2342.40
203	37	120	-13.8	188.64	13.8	188.64	190.44	1764.64	-2184.00
204	43	120	-7.8	60.84	7.8	60.84	60.84	1764.64	-951.60
205	34	122	-17.8	317.64	17.8	317.64	317.64	1584.64	-2342.40
206	34	121	-17.8	317.64	17.8	317.64	317.64	1584.64	-2342.40
207	48	121	-13.8	188.64	13.8	188.64	190.44	1849.44	-1896.00
208	12	140	-32.8	1075.84	32.8	1075.84	1075.84	128.96	-4352.00
209	40	120	-4.8	23.04	4.8	23.04	23.04	1600.00	-96.00
210	37	121	-13.8	188.64	13.8	188.64	190.44	1764.64	-2184.00
211	38	120	-12.8	163.84	12.8	163.84	163.84	1521.00	-1920.00
212	32	122	-18.8	353.44	18.8	353.44	353.44	1764.64	-2342.40
213	42	122	-8.8	77.44	8.8	77.44	77.44	1764.64	-1152.00
214	32	120	-18.8	353.44	18.8	353.44	353.44	1584.64	-2342.40
215	32	122	-18.8	353.44	18.8	353.44	353.44	1764.64	-2342.40
216	34	122	-16.8	282.24	16.8	282.24	282.24	1584.64	-2184.00
217	12	141	-34.8	1211.04	34.8	1211.04	1211.04	141.00	-4819.20
218	32	120	-18.8	353.44	18.8	353.44	353.44	1764.64	-2342.40
219	32	124	-18.8	353.44	18.8	353.44	353.44	1764.64	-2342.40
220	32	122	-18.8	353.44	18.8	353.44	353.44	1584.64	-2342.40
221	32	122	-18.8	353.44	18.8	353.44	353.44	1764.64	-2342.40
222	37	122	-13.8	188.64	13.8	188.64	190.44	1764.64	-2184.00
223	32	122	-18.8	353.44	18.8	353.44	353.44	1764.64	-2342.40
224	37	122	-13.8	188.64	13.8	188.64	190.44	1764.64	-2184.00
225	32	122	-18.8	353.44	18.8	353.44	353.44	1764.64	-2342.40
226	12	102	-34.8	1211.04	34.8	1211.04	1211.04	141.00	-4819.20
227	42	122	-8.8	77.44	8.8	77.44	77.44	1764.64	-1152.00
228	37	122	-13.8	188.64	13.8	188.64	190.44	1764.64	-2184.00
229	17	88	-31.8	1011.24	31.8	1011.24	1011.24	324.00	-3408.00
230	21	122	-27.8	772.84	27.8	772.84	772.84	462.49	-3408.00
231	42	122	-8.8	77.44	8.8	77.44	77.44	1764.64	-1152.00
232	37	144	-12.8	163.84	12.8	163.84	163.84	1521.00	-1920.00
233	32	124	-18.8	353.44	18.8	353.44	353.44	1764.64	-2342.40
234	37	124	-13.8	188.64	13.8	188.64	190.44	1764.64	-2184.00
235	32	124	-18.8	353.44	18.8	353.44	353.44	1764.64	-2342.40
236	30	111	-32.8	1075.84	32.8	1075.84	1075.84	128.96	-4352.00

TABLE IV b

No.	X	Y	x	y	x ²	y ²	xy
235	62	172	26.6	35.2	707.56	1239.04	936.32
236	45	147	9.6	10.2	92.16	104.04	97.92
237	21	106	-14.4	-30.8	207.36	948.64	443.52
238	36	128	.6	- 8.8	.36	77.44	- 5.28
239	42	127	6.6	- 7.8	43.56	60.84	- 51.48
240	45	152	9.6	15.2	92.16	231.04	145.92
241	37	164	1.6	27.2	2.56	739.84	43.52
242	26	131	- 9.4	- 5.8	88.36	33.64	54.52
243	36	139	.6	2.2	.36	4.84	1.32
244	46	143	10.6	6.2	112.36	38.44	65.72
245	25	134	-10.4	- 2.8	108.16	7.84	29.12
246	60	149	24.6	12.2	605.16	148.84	300.12
247	24	129	-11.4	- 7.8	129.96	60.84	88.92
248	43	146	7.6	9.2	57.76	84.64	69.92
249	32	130	- 3.4	- 6.8	11.56	46.24	23.12
250	31	120	- 4.4	-16.8	19.36	282.24	73.92
251	23	140	-12.4	3.2	153.76	10.24	- 39.68
252	45	148	9.6	11.2	92.16	125.44	107.52
253	38	108	2.6	-28.8	6.76	829.44	- 74.88
254	46	161	10.6	24.2	112.36	585.64	256.52
255	36	149	.6	12.2	.36	148.84	7.32
256	56	156	20.6	19.2	424.36	368.64	395.52
257	23	128	-12.4	8.8	153.76	77.44	- 109.12
258	46	153	10.6	16.2	112.36	266.44	171.72
259	56	140	20.6	3.2	424.36	10.24	65.92
260	31	133	- 4.4	- 3.8	19.36	14.44	16.72
261	30	164	- 5.4	27.2	29.16	739.84	- 146.88
262	53	166	17.6	29.2	309.76	852.64	513.92
263	36	124	.6	-12.8	.36	163.84	- 7.68
264	38	123	2.6	-13.8	6.76	190.44	- 35.88
265	33	139	- 2.4	2.2	5.76	4.84	- 5.28
266	19	111	-16.4	25.8	268.96	665.64	- 423.12
267	48	162	12.6	25.2	158.76	635.04	317.52
268	34	143	- 1.4	6.2	1.96	38.44	- 8.68
269	28	97	- 7.4	-39.8	54.76	1584.04	294.52
270	46	162	10.6	25.2	112.36	635.04	267.12
271	26	135	-11.4	- 1.8	129.96	3.24	20.52
272	35	156	- .4	19.2	.16	368.64	- 7.68
273	36	90	.6	-46.8	.36	2190.24	- 28.08
274	35	105	- .4	-31.8	.16	1011.24	12.72
275	19	153	-16.4	16.2	268.96	262.44	- 265.68
276	31	148	- 4.4	11.2	19.36	125.44	- 49.28
277	52	170	16.6	33.2	275.56	1102.24	551.12
278	28	146	- 7.4	9.2	54.76	84.64	- 68.08
279	46	151	10.6	14.2	112.36	201.64	150.52
280	32	136	- 3.4	- .8	11.56	.64	2.72
281	21	117	-14.4	-19.8	207.36	392.04	285.12
282	40	143	4.6	6.2	21.16	38.44	28.52

TABLE IV b

No.	X	Y	x	y	X	Y	x	y
232	40	143	4.6	8.8	38.44	38.78	38.44	38.78
233	41	144	4.7	8.9	39.06	39.40	39.06	39.40
234	42	145	4.8	9.0	39.69	39.99	39.69	39.99
235	43	146	4.9	9.1	40.33	40.59	40.33	40.59
236	44	147	5.0	9.2	40.98	41.17	40.98	41.17
237	45	148	5.1	9.3	41.64	41.74	41.64	41.74
238	46	149	5.2	9.4	42.31	42.29	42.31	42.29
239	47	150	5.3	9.5	42.99	42.83	42.99	42.83
240	48	151	5.4	9.6	43.68	43.35	43.68	43.35
241	49	152	5.5	9.7	44.38	43.85	44.38	43.85
242	50	153	5.6	9.8	45.09	44.33	45.09	44.33
243	51	154	5.7	9.9	45.81	44.79	45.81	44.79
244	52	155	5.8	10.0	46.54	45.23	46.54	45.23
245	53	156	5.9	10.1	47.28	45.65	47.28	45.65
246	54	157	6.0	10.2	48.03	46.05	48.03	46.05
247	55	158	6.1	10.3	48.79	46.43	48.79	46.43
248	56	159	6.2	10.4	49.56	46.79	49.56	46.79
249	57	160	6.3	10.5	50.34	47.13	50.34	47.13
250	58	161	6.4	10.6	51.13	47.45	51.13	47.45
251	59	162	6.5	10.7	51.93	47.75	51.93	47.75
252	60	163	6.6	10.8	52.74	48.03	52.74	48.03
253	61	164	6.7	10.9	53.56	48.29	53.56	48.29
254	62	165	6.8	11.0	54.39	48.53	54.39	48.53
255	63	166	6.9	11.1	55.23	48.75	55.23	48.75
256	64	167	7.0	11.2	56.08	48.95	56.08	48.95
257	65	168	7.1	11.3	56.94	49.13	56.94	49.13
258	66	169	7.2	11.4	57.81	49.29	57.81	49.29
259	67	170	7.3	11.5	58.69	49.43	58.69	49.43
260	68	171	7.4	11.6	59.58	49.55	59.58	49.55
261	69	172	7.5	11.7	60.48	49.65	60.48	49.65
262	70	173	7.6	11.8	61.39	49.73	61.39	49.73
263	71	174	7.7	11.9	62.31	49.79	62.31	49.79
264	72	175	7.8	12.0	63.24	49.83	63.24	49.83
265	73	176	7.9	12.1	64.18	49.85	64.18	49.85
266	74	177	8.0	12.2	65.13	49.85	65.13	49.85
267	75	178	8.1	12.3	66.09	49.82	66.09	49.82
268	76	179	8.2	12.4	67.06	49.77	67.06	49.77
269	77	180	8.3	12.5	68.04	49.69	68.04	49.69
270	78	181	8.4	12.6	69.03	49.58	69.03	49.58
271	79	182	8.5	12.7	70.04	49.44	70.04	49.44
272	80	183	8.6	12.8	71.06	49.27	71.06	49.27
273	81	184	8.7	12.9	72.09	49.07	72.09	49.07
274	82	185	8.8	13.0	73.13	48.84	73.13	48.84
275	83	186	8.9	13.1	74.18	48.58	74.18	48.58
276	84	187	9.0	13.2	75.24	48.29	75.24	48.29
277	85	188	9.1	13.3	76.31	47.96	76.31	47.96
278	86	189	9.2	13.4	77.39	47.60	77.39	47.60
279	87	190	9.3	13.5	78.48	47.21	78.48	47.21
280	88	191	9.4	13.6	79.58	46.78	79.58	46.78
281	89	192	9.5	13.7	80.69	46.32	80.69	46.32
282	90	193	9.6	13.8	81.81	45.83	81.81	45.83
283	91	194	9.7	13.9	82.94	45.30	82.94	45.30
284	92	195	9.8	14.0	84.08	44.74	84.08	44.74
285	93	196	9.9	14.1	85.23	44.14	85.23	44.14
286	94	197	10.0	14.2	86.39	43.51	86.39	43.51
287	95	198	10.1	14.3	87.56	42.84	87.56	42.84
288	96	199	10.2	14.4	88.74	42.14	88.74	42.14
289	97	200	10.3	14.5	89.93	41.40	89.93	41.40
290	98	201	10.4	14.6	91.13	40.63	91.13	40.63
291	99	202	10.5	14.7	92.34	39.82	92.34	39.82
292	100	203	10.6	14.8	93.56	38.98	93.56	38.98
293	101	204	10.7	14.9	94.79	38.10	94.79	38.10
294	102	205	10.8	15.0	96.03	37.19	96.03	37.19
295	103	206	10.9	15.1	97.28	36.24	97.28	36.24
296	104	207	11.0	15.2	98.54	35.26	98.54	35.26
297	105	208	11.1	15.3	99.81	34.24	99.81	34.24
298	106	209	11.2	15.4	101.09	33.18	101.09	33.18
299	107	210	11.3	15.5	102.38	32.08	102.38	32.08
300	108	211	11.4	15.6	103.68	30.94	103.68	30.94
301	109	212	11.5	15.7	104.99	29.76	104.99	29.76
302	110	213	11.6	15.8	106.31	28.54	106.31	28.54
303	111	214	11.7	15.9	107.64	27.28	107.64	27.28
304	112	215	11.8	16.0	108.98	25.98	108.98	25.98
305	113	216	11.9	16.1	110.33	24.64	110.33	24.64
306	114	217	12.0	16.2	111.69	23.26	111.69	23.26
307	115	218	12.1	16.3	113.06	21.84	113.06	21.84
308	116	219	12.2	16.4	114.44	20.38	114.44	20.38
309	117	220	12.3	16.5	115.83	18.88	115.83	18.88
310	118	221	12.4	16.6	117.23	17.34	117.23	17.34
311	119	222	12.5	16.7	118.64	15.76	118.64	15.76
312	120	223	12.6	16.8	120.06	14.14	120.06	14.14
313	121	224	12.7	16.9	121.49	12.48	121.49	12.48
314	122	225	12.8	17.0	122.93	10.78	122.93	10.78
315	123	226	12.9	17.1	124.38	9.04	124.38	9.04
316	124	227	13.0	17.2	125.84	7.26	125.84	7.26
317	125	228	13.1	17.3	127.31	5.44	127.31	5.44
318	126	229	13.2	17.4	128.79	3.58	128.79	3.58
319	127	230	13.3	17.5	130.28	1.68	130.28	1.68
320	128	231	13.4	17.6	131.78	-0.26	131.78	-0.26
321	129	232	13.5	17.7	133.29	-2.16	133.29	-2.16
322	130	233	13.6	17.8	134.81	-4.01	134.81	-4.01
323	131	234	13.7	17.9	136.34	-5.81	136.34	-5.81
324	132	235	13.8	18.0	137.88	-7.56	137.88	-7.56
325	133	236	13.9	18.1	139.43	-9.26	139.43	-9.26
326	134	237	14.0	18.2	140.99	-10.91	140.99	-10.91
327	135	238	14.1	18.3	142.56	-12.51	142.56	-12.51
328	136	239	14.2	18.4	144.14	-14.06	144.14	-14.06
329	137	240	14.3	18.5	145.73	-15.56	145.73	-15.56
330	138	241	14.4	18.6	147.33	-17.01	147.33	-17.01
331	139	242	14.5	18.7	148.94	-18.41	148.94	-18.41
332	140	243	14.6	18.8	150.56	-19.76	150.56	-19.76
333	141	244	14.7	18.9	152.19	-21.06	152.19	-21.06
334	142	245	14.8	19.0	153.83	-22.31	153.83	-22.31
335	143	246	14.9	19.1	155.48	-23.51	155.48	-23.51
336	144	247	15.0	19.2	157.14	-24.66	157.14	-24.66
337	145	248	15.1	19.3	158.81	-25.76	158.81	-25.76
338	146	249	15.2	19.4	160.49	-26.81	160.49	-26.81
339	147	250	15.3	19.5	162.18	-27.81	162.18	-27.81
340	148	251	15.4	19.6	163.88	-28.76	163.88	-28.76
341	149	252	15.5	19.7	165.59	-29.66	165.59	-29.66
342	150	253	15.6	19.8	167.31	-30.51	167.31	-30.51
343	151	254	15.7	19.9	169.04	-31.31	169.04	-31.31
344	152	255	15.8	20.0	170.78	-32.06	170.78	-32.06
345	153	256	15.9	20.1	172.53	-32.76	172.53	-32.76
346	154	257	16.0	20.2	174.29	-33.41	174.29	-33.41
347	155	258	16.1	20.3	176.06	-34.01	176.06	-34.01
348	156	259	16.2	20.4	177.84	-34.56	177.84	-34.56
349	157	260	16.3	20.5	179.63	-35.06	179.63	-35.06
350	158	261	16.4	20.6	181.43	-35.51	181.43	-35.51
351	159	262	16.5	20.7	183.24	-35.91	183.24	-35.91
352	160	263	16.6	20.8	185.06	-36.26	185.06	-36.26
353	161	264	16.7	20.9	186.89	-36.56	186.89	-36.56
354	162	265	16.8	21.0	188.73	-36.81	188.73	-36.81
355	163	266	16.9	21.1	190.58	-37.01	190.58	-37.01
356	164	267	17.0	21.2	192.44	-37.16	192.44	-37.16
357	165	268	17.1	21.3	194.31	-37.26	194.31	-37.26
358	166	269	17.2	21.4	196.19	-37.31	196.19	-37.31
359	167	270	17.3	21.5	198.08	-37.31	198.08	-37.31
360	168	271	17.4	21.6	199.98	-37.26	199.98	-37.26
361	169	272	17.5	21.7	201.89	-37.16	201.89	-37.16
362	170	273	17.6	21.8	203.81	-37.01	203.81	-37.01
363	171	274	17.7	21.9	205.74	-36.81	205.74	-36.81
364	172	275	17.8	22.0	207.68	-36.56	207.68	-36.56
365	173	276	17.9	22.1	209.63	-36.26	209.63	-36.26
366	174	277	18.0	22.2	211.59	-35.91	211.59	-35.91
367	175	278	18.1	22.3	213.56	-35.51	213.56	-35.51
368	176	279	18.2	22.4	215.54	-35.06	215.54	-35.06
369	177	280	18.3	22.5	217.53	-34.56	217.53	-34.56
370	178	281	18.4	22.6	219.53	-34.01	219.53	-34.01
371	179	282	18.5	22.7	221.54	-33.41	221.54	-33.41
372	180	283	18.6	22.8				

TABLE IV b

No.	X	Y	x	y	x ²	y ²	xy
283	44	159	8.6	22.2	73.96	492.84	190.92
284	54	137	18.6	.2	345.96	.04	3.72
285	36	121	.6	-15.8	.36	249.64	- 9.48
286	46	154	10.6	17.2	112.36	295.84	182.32
287	29	100	- 6.4	-36.8	40.96	1354.24	235.52
288	31	148	- 4.4	11.2	19.36	125.44	- 49.28
289	49	146	13.6	9.2	184.96	84.64	125.12
290	52	166	16.6	29.2	275.56	852.64	484.72
291	39	137	3.6	.2	12.96	.04	.72
292	39	146	3.6	9.2	12.96	84.64	33.12
293	56	187	20.6	50.2	424.36	2520.04	1034.12
294	49	121	13.6	-15.8	184.96	249.64	- 214.88
295	37	176	1.6	39.2	2.56	1536.64	62.72
296	52	122	16.6	-14.8	275.56	219.04	- 245.68
297	35	138	- .4	1.2	.16	1.44	- .48
298	45	124	9.6	-12.8	92.16	163.84	- 122.88
299	57	158	21.6	21.2	466.56	449.44	457.92
300	40	135	4.6	- 1.8	21.16	3.24	- 8.28
301	22	160	-13.4	23.2	179.56	538.24	- 310.88
302	45	140	9.6	3.2	92.16	10.24	30.72
303	46	178	10.6	41.2	112.36	1697.44	436.72
304	27	129	- 8.4	- 7.8	70.56	60.84	65.52
305	32	152	- 3.4	15.2	11.56	231.04	- 51.68
306	19	130	-16.4	- 6.8	268.96	46.24	111.52
307	30	136	- 5.4	- .8	29.16	.64	4.32
308	41	131	5.6	- 5.8	31.36	33.64	- 32.48
309	15	83	-20.4	-53.8	416.16	2894.44	1097.52
310	54	159	18.6	22.2	345.96	492.84	412.92
311	27	107	- 8.4	-29.8	70.56	888.04	250.32
312	25	118	-10.4	-18.8	108.16	353.44	195.52
313	34	131	- 1.4	- 5.8	1.96	33.64	8.12
314	41	150	5.6	13.2	31.36	174.24	73.92
315	15	123	-20.4	-13.8	416.16	190.44	281.52
316	45	130	9.6	- 6.8	92.16	46.24	- 65.28
317	37	122	1.6	-14.8	2.56	219.04	- 23.68
318	34	138	- 1.4	1.2	1.96	1.44	- 1.68
319	20	137	-15.4	.2	243.36	.04	- 3.08
320	33	132	- 2.4	- 4.8	5.76	23.04	11.52
321	21	124	-14.4	-12.8	207.36	163.84	184.32
322	30	108	- 5.4	-28.8	29.16	829.44	155.52
323	22	116	-13.4	-20.8	179.56	432.64	278.72
324	23	119	-12.4	-17.8	153.76	316.84	220.72
325	26	106	- 9.4	-30.8	88.36	948.64	289.52
326	40	129	4.6	- 7.8	21.16	60.84	- 35.88
327	18	113	-17.4	-23.8	302.76	566.44	414.12
328	7	67	-23.4	-69.8	806.56	4872.04	1982.32
329	20	100	-15.4	-36.8	237.16	1354.24	566.72
330	9	91	-26.4	-45.8	696.96	2097.64	1209.12

TABLE IV b

No.	X	Y	x	y	X	Y	xy
283	44	122	8.8	24.4	32.8	122.8	190.92
284	45	127	9.0	27.0	33.8	127.8	211.32
285	46	131	9.2	29.2	34.8	131.8	231.72
286	47	134	9.4	31.4	35.8	134.8	252.12
287	48	137	9.6	33.6	36.8	137.8	272.52
288	49	140	9.8	35.8	37.8	140.8	292.92
289	50	143	10.0	38.0	38.8	143.8	313.32
290	51	146	10.2	40.2	39.8	146.8	333.72
291	52	149	10.4	42.4	40.8	149.8	354.12
292	53	152	10.6	44.6	41.8	152.8	374.52
293	54	155	10.8	46.8	42.8	155.8	394.92
294	55	158	11.0	49.0	43.8	158.8	415.32
295	56	161	11.2	51.2	44.8	161.8	435.72
296	57	164	11.4	53.4	45.8	164.8	456.12
297	58	167	11.6	55.6	46.8	167.8	476.52
298	59	170	11.8	57.8	47.8	170.8	496.92
299	60	173	12.0	60.0	48.8	173.8	517.32
300	61	176	12.2	62.2	49.8	176.8	537.72
301	62	179	12.4	64.4	50.8	179.8	558.12
302	63	182	12.6	66.6	51.8	182.8	578.52
303	64	185	12.8	68.8	52.8	185.8	598.92
304	65	188	13.0	71.0	53.8	188.8	619.32
305	66	191	13.2	73.2	54.8	191.8	639.72
306	67	194	13.4	75.4	55.8	194.8	660.12
307	68	197	13.6	77.6	56.8	197.8	680.52
308	69	200	13.8	79.8	57.8	200.8	700.92
309	70	203	14.0	82.0	58.8	203.8	721.32
310	71	206	14.2	84.2	59.8	206.8	741.72
311	72	209	14.4	86.4	60.8	209.8	762.12
312	73	212	14.6	88.6	61.8	212.8	782.52
313	74	215	14.8	90.8	62.8	215.8	802.92
314	75	218	15.0	93.0	63.8	218.8	823.32
315	76	221	15.2	95.2	64.8	221.8	843.72
316	77	224	15.4	97.4	65.8	224.8	864.12
317	78	227	15.6	99.6	66.8	227.8	884.52
318	79	230	15.8	101.8	67.8	230.8	904.92
319	80	233	16.0	104.0	68.8	233.8	925.32
320	81	236	16.2	106.2	69.8	236.8	945.72
321	82	239	16.4	108.4	70.8	239.8	966.12
322	83	242	16.6	110.6	71.8	242.8	986.52
323	84	245	16.8	112.8	72.8	245.8	1006.92
324	85	248	17.0	115.0	73.8	248.8	1027.32
325	86	251	17.2	117.2	74.8	251.8	1047.72
326	87	254	17.4	119.4	75.8	254.8	1068.12
327	88	257	17.6	121.6	76.8	257.8	1088.52
328	89	260	17.8	123.8	77.8	260.8	1108.92
329	90	263	18.0	126.0	78.8	263.8	1129.32
330	91	266	18.2	128.2	79.8	266.8	1149.72
331	92	269	18.4	130.4	80.8	269.8	1170.12
332	93	272	18.6	132.6	81.8	272.8	1190.52
333	94	275	18.8	134.8	82.8	275.8	1210.92
334	95	278	19.0	137.0	83.8	278.8	1231.32
335	96	281	19.2	139.2	84.8	281.8	1251.72
336	97	284	19.4	141.4	85.8	284.8	1272.12
337	98	287	19.6	143.6	86.8	287.8	1292.52
338	99	290	19.8	145.8	87.8	290.8	1312.92
339	100	293	20.0	148.0	88.8	293.8	1333.32
340	101	296	20.2	150.2	89.8	296.8	1353.72
341	102	299	20.4	152.4	90.8	299.8	1374.12
342	103	302	20.6	154.6	91.8	302.8	1394.52
343	104	305	20.8	156.8	92.8	305.8	1414.92
344	105	308	21.0	159.0	93.8	308.8	1435.32
345	106	311	21.2	161.2	94.8	311.8	1455.72
346	107	314	21.4	163.4	95.8	314.8	1476.12
347	108	317	21.6	165.6	96.8	317.8	1496.52
348	109	320	21.8	167.8	97.8	320.8	1516.92
349	110	323	22.0	170.0	98.8	323.8	1537.32
350	111	326	22.2	172.2	99.8	326.8	1557.72

TABLE IV b

No.	X	Y	x	y	x ²	y ²	xy
331	20	147	-15.4	10.2	237.16	104.04	- 157.08
332	25	93	-10.4	-43.8	108.16	1918.44	455.52
333	11	120	-24.4	-16.8	595.36	282.24	409.92
334	25	122	-10.4	-14.8	108.16	219.04	153.92
335	27	114	- 8.4	-22.8	70.56	519.84	191.52
336	16	139	-19.4	2.2	376.36	4.84	- 42.68
337	26	119	- 9.4	-17.8	88.36	316.84	167.32
338	21	110	-14.4	-26.8	207.36	718.24	385.92
339	16	111	-19.4	-25.8	376.36	665.64	500.52
340	18	113	-17.4	-23.8	302.76	566.44	414.12
341	20	82	-15.4	-54.8	237.16	3003.04	843.92
342	30	143	- 5.4	6.2	29.16	38.44	- 33.48
340	12,032	46,516			44,870.0	157,969.4	48,799.94
	35.39	136.8					

Using Garrett's equation:

$$\text{The coeff of correlation, } r = \frac{\sum xy}{\sqrt{\sum x^2} \times \sqrt{\sum y^2}} = \frac{48,799.94}{\sqrt{44,870} \times \sqrt{157,969.4}}$$

$$r = \frac{48,799.94}{84,190.50} = 0.58$$

$$\text{Probable Error} = \frac{.6745 \times (1-.3364)}{\sqrt{340}} = \frac{.4479}{18.44} = 0.024$$

TABLE IV D

No.	X	Y	x	y	X	Y	xy
331	30	145	- 5.4	6.8	35.16	38.44	- 35.48
332	30	88	- 5.4	- 54.8	337.16	3003.96	843.92
333	31	150	- 4.4	6.8	39.16	403.96	- 35.48
334	32	128	- 3.4	- 10.4	11.56	108.16	- 35.48
335	33	93	- 2.4	- 43.8	5.76	1916.44	104.04
336	34	160	- 1.4	6.8	1.96	382.34	131.92
337	35	138	- .4	- 10.4	.16	108.16	- 35.48
338	36	114	.6	- 8.4	3.6	70.56	319.94
339	37	119	1.6	- 17.8	2.56	318.84	- 35.48
340	38	110	2.6	- 28.8	6.76	307.36	193.94
341	39	111	3.6	- 37.8	12.96	1423.64	300.92
342	40	112	4.6	- 47.8	21.16	2276.44	414.12
343	41	143	5.6	6.8	31.36	403.96	38.44
344	42	147	6.6	10.8	43.56	462.04	- 35.48
345	43	93	7.6	- 43.8	57.76	1916.44	104.04
346	44	160	8.6	6.8	73.96	403.96	- 35.48
347	45	128	9.6	- 10.4	92.16	108.16	- 35.48
348	46	114	10.6	- 8.4	112.36	70.56	319.94
349	47	119	11.6	- 17.8	134.56	318.84	- 35.48
350	48	110	12.6	- 28.8	158.76	307.36	193.94
351	49	111	13.6	- 37.8	184.96	1423.64	300.92
352	50	112	14.6	- 47.8	213.16	2276.44	414.12
353	51	143	15.6	6.8	243.36	403.96	38.44
354	52	147	16.6	10.8	275.56	462.04	- 35.48
355	53	93	17.6	- 43.8	310.76	1916.44	104.04
356	54	160	18.6	6.8	345.96	403.96	- 35.48
357	55	128	19.6	- 10.4	384.16	108.16	- 35.48
358	56	114	20.6	- 8.4	424.36	70.56	319.94
359	57	119	21.6	- 17.8	466.56	318.84	- 35.48
360	58	110	22.6	- 28.8	510.76	307.36	193.94
361	59	111	23.6	- 37.8	556.96	1423.64	300.92
362	60	112	24.6	- 47.8	605.16	2276.44	414.12
363	61	143	25.6	6.8	655.36	403.96	38.44
364	62	147	26.6	10.8	707.56	462.04	- 35.48
365	63	93	27.6	- 43.8	761.76	1916.44	104.04
366	64	160	28.6	6.8	817.96	403.96	- 35.48
367	65	128	29.6	- 10.4	876.16	108.16	- 35.48
368	66	114	30.6	- 8.4	936.36	70.56	319.94
369	67	119	31.6	- 17.8	998.56	318.84	- 35.48
370	68	110	32.6	- 28.8	1068.76	307.36	193.94
371	69	111	33.6	- 37.8	1140.96	1423.64	300.92
372	70	112	34.6	- 47.8	1215.16	2276.44	414.12
373	71	143	35.6	6.8	1292.36	403.96	38.44
374	72	147	36.6	10.8	1377.56	462.04	- 35.48
375	73	93	37.6	- 43.8	1465.76	1916.44	104.04
376	74	160	38.6	6.8	1559.96	403.96	- 35.48
377	75	128	39.6	- 10.4	1658.16	108.16	- 35.48
378	76	114	40.6	- 8.4	1759.36	70.56	319.94
379	77	119	41.6	- 17.8	1862.56	318.84	- 35.48
380	78	110	42.6	- 28.8	1967.76	307.36	193.94
381	79	111	43.6	- 37.8	2074.96	1423.64	300.92
382	80	112	44.6	- 47.8	2184.16	2276.44	414.12
383	81	143	45.6	6.8	2295.36	403.96	38.44
384	82	147	46.6	10.8	2407.56	462.04	- 35.48
385	83	93	47.6	- 43.8	2520.76	1916.44	104.04
386	84	160	48.6	6.8	2635.96	403.96	- 35.48
387	85	128	49.6	- 10.4	2752.16	108.16	- 35.48
388	86	114	50.6	- 8.4	2869.36	70.56	319.94
389	87	119	51.6	- 17.8	2987.56	318.84	- 35.48
390	88	110	52.6	- 28.8	3106.76	307.36	193.94
391	89	111	53.6	- 37.8	3226.96	1423.64	300.92
392	90	112	54.6	- 47.8	3348.16	2276.44	414.12
393	91	143	55.6	6.8	3469.36	403.96	38.44
394	92	147	56.6	10.8	3591.56	462.04	- 35.48
395	93	93	57.6	- 43.8	3714.76	1916.44	104.04
396	94	160	58.6	6.8	3838.96	403.96	- 35.48
397	95	128	59.6	- 10.4	3963.16	108.16	- 35.48
398	96	114	60.6	- 8.4	4087.36	70.56	319.94
399	97	119	61.6	- 17.8	4212.56	318.84	- 35.48
400	98	110	62.6	- 28.8	4338.76	307.36	193.94
401	99	111	63.6	- 37.8	4465.96	1423.64	300.92
402	100	112	64.6	- 47.8	4593.16	2276.44	414.12
403	101	143	65.6	6.8	4720.36	403.96	38.44
404	102	147	66.6	10.8	4847.56	462.04	- 35.48
405	103	93	67.6	- 43.8	4974.76	1916.44	104.04
406	104	160	68.6	6.8	5101.96	403.96	- 35.48
407	105	128	69.6	- 10.4	5228.16	108.16	- 35.48
408	106	114	70.6	- 8.4	5354.36	70.56	319.94
409	107	119	71.6	- 17.8	5480.56	318.84	- 35.48
410	108	110	72.6	- 28.8	5606.76	307.36	193.94
411	109	111	73.6	- 37.8	5732.96	1423.64	300.92
412	110	112	74.6	- 47.8	5858.16	2276.44	414.12
413	111	143	75.6	6.8	5983.36	403.96	38.44
414	112	147	76.6	10.8	6108.56	462.04	- 35.48
415	113	93	77.6	- 43.8	6233.76	1916.44	104.04
416	114	160	78.6	6.8	6358.96	403.96	- 35.48
417	115	128	79.6	- 10.4	6483.16	108.16	- 35.48
418	116	114	80.6	- 8.4	6607.36	70.56	319.94
419	117	119	81.6	- 17.8	6731.56	318.84	- 35.48
420	118	110	82.6	- 28.8	6855.76	307.36	193.94
421	119	111	83.6	- 37.8	6979.96	1423.64	300.92
422	120	112	84.6	- 47.8	7103.16	2276.44	414.12
423	121	143	85.6	6.8	7226.36	403.96	38.44
424	122	147	86.6	10.8	7349.56	462.04	- 35.48
425	123	93	87.6	- 43.8	7472.76	1916.44	104.04
426	124	160	88.6	6.8	7595.96	403.96	- 35.48
427	125	128	89.6	- 10.4	7718.16	108.16	- 35.48
428	126	114	90.6	- 8.4	7840.36	70.56	319.94
429	127	119	91.6	- 17.8	7962.56	318.84	- 35.48
430	128	110	92.6	- 28.8	8084.76	307.36	193.94
431	129	111	93.6	- 37.8	8206.96	1423.64	300.92
432	130	112	94.6	- 47.8	8328.16	2276.44	414.12
433	131	143	95.6	6.8	8449.36	403.96	38.44
434	132	147	96.6	10.8	8570.56	462.04	- 35.48
435	133	93	97.6	- 43.8	8691.76	1916.44	104.04
436	134	160	98.6	6.8	8812.96	403.96	- 35.48
437	135	128	99.6	- 10.4	8933.16	108.16	- 35.48
438	136	114	100.6	- 8.4	9053.36	70.56	319.94
439	137	119	101.6	- 17.8	9173.56	318.84	- 35.48
440	138	110	102.6	- 28.8	9293.76	307.36	193.94
441	139	111	103.6	- 37.8	9413.96	1423.64	300.92
442	140	112	104.6	- 47.8	9534.16	2276.44	414.12
443	141	143	105.6	6.8	9654.36	403.96	38.44
444	142	147	106.6	10.8	9774.56	462.04	- 35.48
445	143	93	107.6	- 43.8	9894.76	1916.44	104.04
446	144	160	108.6	6.8	10014.96	403.96	- 35.48
447	145	128	109.6	- 10.4	10135.16	108.16	- 35.48
448	146	114	110.6	- 8.4	10255.36	70.56	319.94
449	147	119	111.6	- 17.8	10375.56	318.84	- 35.48
450	148	110	112.6	- 28.8	10495.76	307.36	193.94
451	149	111	113.6	- 37.8	10615.96	1423.64	300.92
452	150	112	114.6	- 47.8	10736.16	2276.44	414.12
453	151	143	115.6	6.8	10856.36	403.96	38.44
454	152	147	116.6	10.8	10976.56	462.04	- 35.48
455	153	93	117.6	- 43.8	11096.76	1916.44	104.04
456	154	160	118.6	6.8	11216.96	403.96	- 35.48
457	155	128	119.6	- 10.4	11337.16	108.16	- 35.48
458	156	114	120.6	- 8.4	11457.36	70.56	319.94
459	157	119	121.6	- 17.8	11577.56	318.84	- 35.48
460	158	110	122.6	- 28.8	11697.76	307.36	193.94
461	159	111	123.6	- 37.8	11817.96	1423.64	300.92
462	160	112	124.6	- 47.8	11938.16	2276.44	414.12
463	161	143	125.6	6.8	12058.36	403.96	38.44
464	162	147	126.6	10.8	12178.56	462.04	- 35.48
465	163	93	127.6	- 43.8	12298.76	1916.44	104.04
466	164	160	128.6	6.8	12418.96	403.96	- 35.48
467	165	128	129.6	- 10.4	12539.16	108.16	- 35.48
468	166	114	130.6	- 8.4	12659.36	70.56	319.94
469	167	119	131.6	- 17.8	12779.56	318.84	- 35.48
470	168	110	132.6	- 28.8	12899.76	307.36	193.94
471	169	111	133.6	- 37.8	13019.96	1423.64	300.92
472	170	112	134.6	- 47.8	13139.16	2276.44	414.12
473	171	143	135.6	6.8	13259.36	403.96	38.44
474	172	147	136.6	10.8	13379.56	462.04	- 35.48
475	173	93	137.6	- 43.8	13499.76	1916.44	104.04
476	174	160	138.6	6.8	13619.96	403.96	- 35.48
477	175	128	139.6	- 10.4	13739.16	108.16	- 35.48
478	176	114	140.6	- 8.4	13859.36	70.56	319.94
479	177	119	141.6	- 17.8	13979.56	318.84	- 35.48
480	178	110	142.6	- 28.8	14099.76	307.36	193.94
481	179	111	143.6	- 37.8	14219.96	1423.64	300.92
482</							

TABLE IV c Class of 1936

Correlation of Army Alpha and College Placement Scores

No.	X	Y	x	y	x ²	y ²	xy
36-1	26	135	3.5	-8	12.25	64	- 28.
2	26	125	3.5	-18	12.25	324	- 63.
3	17	127	- 5.5	-16	30.25	256	88.
4	27	110	4.5	-33	20.25	1089	148.5
5	24	137	1.5	- 6	2.25	36	- 9.
6	30	134	7.5	- 9	56.25	81	- 67.5
7	28	157	5.5	14	30.25	196	77.
8	28	135	5.5	- 8	30.25	64	- 44.
9	14	152	- 8.5	9	72.25	81	- 76.5
10	30	130	7.5	-13	56.25	169	- 97.5
11	24	160	1.5	17	2.25	289	25.5
12	20	168	- 2.5	25	6.25	625	- 62.5
13	29	181	6.5	38	42.25	1444	247.
14	20	132	- 2.5	-11	6.25	121	27.5
15	--	---	----	--	----	----	----
16	29	138	6.5	- 5	42.25	25	- 32.5
17	29	163	6.5	20	42.25	400	130.
18	27	161	4.5	18	20.25	324	81.
19	27	140	4.5	- 3	20.25	9	- 13.5
20	19	108	- 3.5	-35	12.25	1225	122.5
21	29	107	6.5	-36	42.25	1296	-234.
22	19	173	- 3.5	30	12.25	900	-105.
23	22	134	- .5	- 9	.25	81	4.5
24	27	132	4.5	-11	20.25	121	- 49.5
25	23	170	.5	27	.25	729	13.5
26	30	168	7.5	25	56.25	625	187.5
27	24	153	1.5	10	2.25	100	15.
28	28	119	5.5	-24	30.25	576	-132.
29	23	145	.5	2	.25	4	1.
30	4	115	-18.5	-28	342.25	784	518.
31	26	135	3.5	- 8	12.25	64	- 28.
32	13	151	- 9.5	8	90.25	64	- 76.
33	18	135	- 4.5	- 8	20.25	64	36.
34	16	118	- 6.5	-25	42.25	625	162.5
35	23	148	.5	5	.25	25	2.5
36	28	146	5.5	3	30.25	9	16.5
37	20	135	- 2.5	- 8	6.25	64	20.
38	27	181	4.5	38	20.25	1444	171.
39	12	108	-10.5	-35	110.25	1225	367.5
40	19	130	- 3.5	-14	12.25	196	49.
41	12	138	-10.5	- 5	110.25	25	52.5
42	27	168	4.5	23	20.25	529	103.5
43	31	126	8.5	-17	72.25	289	-144.5
44	24	149	1.5	6	2.25	36	9.
45	19	142	- 3.5	- 1	12.25	1	3.5
46	25	154	2.5	11	6.25	121	27.5
47	32	124	9.5	-19	90.25	361	-180.5

TABLE IV - Class of 1932

Correlation of Army Alpha and College Placement Scores

No.	X	Y	X	Y	X	Y	X	Y
26-1	86	135	3.5	-8	18.85	64	-38.5	-
2	86	135	3.5	-18	18.85	384	-65.5	-
3	17	187	-8.5	-16	30.85	88	88.5	88.5
4	87	110	4.5	-33	50.85	1088	148.5	148.5
5	84	137	1.5	-6	3.85	36	9.5	-
6	30	134	7.5	-9	56.85	61	-67.5	-
7	88	137	5.5	14	30.85	196	77.5	77.5
8	88	135	5.5	-8	30.85	64	-44.5	-
9	14	132	-8.5	9	78.85	61	-78.5	-
10	80	130	7.5	-13	56.85	169	-97.5	-
11	84	160	1.5	17	3.85	289	83.5	83.5
12	80	168	-8.5	38	4.85	688	-82.5	-
13	89	181	6.5	38	42.85	1444	247.5	247.5
14	80	138	-8.5	-11	6.85	181	27.5	27.5
15	--	--	--	--	--	--	--	--
16	89	136	6.5	-5	48.85	36	-32.5	-
17	39	163	6.5	60	48.85	400	130.5	130.5
18	87	161	4.5	18	30.85	384	81.5	81.5
19	87	140	4.5	-3	30.85	9	-13.5	-
20	19	108	-3.5	-38	18.85	1288	182.5	182.5
21	89	107	6.5	-38	48.85	1896	-124.5	-124.5
22	19	175	-8.5	30	18.85	900	-103.5	-103.5
23	88	134	5.5	-9	3.85	61	4.5	4.5
24	87	132	4.5	-11	30.85	181	-49.5	-49.5
25	83	170	5.5	87	3.85	789	18.5	18.5
26	30	168	7.5	85	56.85	688	187.5	187.5
27	84	163	1.5	10	3.85	100	15.5	15.5
28	88	119	5.5	-24	30.85	876	-132.5	-132.5
29	83	145	5.5	8	3.85	4	1.5	1.5
30	4	115	-18.5	-88	348.85	784	218.5	218.5
31	86	135	3.5	-8	18.85	64	-38.5	-
32	13	131	-9.5	8	30.85	64	-78.5	-
33	18	133	-4.5	-8	30.85	64	36.5	36.5
34	16	118	-6.5	-35	48.85	688	162.5	162.5
35	83	148	5.5	3	3.85	36	8.5	8.5
36	88	146	5.5	3	30.85	9	16.5	16.5
37	80	135	-8.5	-8	6.85	64	30.5	30.5
38	87	181	4.5	38	30.85	1444	171.5	171.5
39	18	108	-10.5	-35	110.85	1828	367.5	367.5
40	19	150	-3.5	-14	18.85	196	49.5	49.5
41	18	138	-10.5	-5	110.85	36	62.5	62.5
42	87	168	4.5	83	30.85	689	103.5	103.5
43	31	156	8.5	-17	72.85	889	-144.5	-144.5
44	84	149	1.5	6	3.85	36	9.5	9.5
45	19	145	-3.5	-1	18.85	1	3.5	3.5
46	85	184	8.5	11	6.85	161	27.5	27.5
47	88	184	8.5	-19	90.85	361	-180.5	-180.5

TABLE IV c

No.	X	Y	x	y	x ²	y ²	xy
48	21	154	- 1.5	11	2.25	121	- 16.5
49	27	173	4.5	30	20.25	900	135.
50	23	156	.5	13	.25	169	6.5
51	16	115	- 6.5	-28	42.25	784	182.
52	26	126	3.5	-17	12.25	289	- 59.5
53	30	173	7.5	30	56.25	900	225.
54	16	143	- 6.5	0	42.25	0	0
55	23	114	.5	-29	.25	841	- 14.5
56	17	142	- 5.5	- 1	30.25	1	5.5
57	22	147	- .5	4	.25	16	- 2.
58	27	107	4.5	-36	20.25	1296	162.
59	--	---	----	--	-----	----	-----
60	27	180	4.5	37	20.25	1369	166.5
61	10	139	-12.5	- 4	156.25	16	50.
62	15	151	- 7.5	8	56.25	64	- 80.
63	32	167	9.5	24	90.25	576	228.
64	23	124	.5	-19	.25	361	- 9.5
65	7	135	-15.5	- 8	240.25	64	124.
66	20	157	- 2.5	14	6.25	196	- 35.
67	18	119	- 4.5	-24	20.25	576	108.
68	27	162	4.5	19	20.25	361	85.5
69	12	138	-10.5	- 5	110.25	25	52.5
70	11	132	- 9.5	-11	90.25	121	104.5
71	19	157	- 3.5	14	12.25	196	- 49.
72	28	168	5.5	25	30.25	625	137.5
73	25	132	2.5	-11	6.25	121	- 27.5
74	24	132	1.5	-11	2.25	121	- 16.5
75	23	127	.5	-16	.25	256	- 9.
76	17	126	- 5.5	-17	30.25	289	93.5
77	28	178	5.5	35	30.25	1225	192.5
78	29	154	6.5	11	42.25	121	71.5
79	20	131	- 2.5	-12	6.25	144	30.
80	24	154	1.5	11	2.25	121	16.5
81	28	166	5.5	23	30.25	529	126.5
82	24	99	1.5	-44	2.25	1936	- 66.
83	26	154	3.5	11	12.25	121	38.5
84	25	169	2.5	26	6.25	676	65.
85	18	148	- 4.5	5	20.25	25	- 22.5
86	17	136	- 5.5	- 7	30.25	49	- 38.5
87	30	127	7.5	-16	56.25	256	-120.
88	27	158	4.5	15	20.25	225	67.5
89	13	140	- 9.5	- 3	90.25	9	28.5
90	27	167	4.5	24	20.25	576	108.
91	18	155	- 4.5	12	20.25	144	- 54.
92	16	139	- 6.5	- 4	42.25	16	26.
93	24	187	1.5	44	2.25	1936	66.
94	23	183	.5	40	.25	1600	20.
95	32	165	9.5	22	90.25	484	209.

TABLE IV

No.	X	Y	X	Y	X	Y	X	Y
48	81	134	-1.5	11	8.25	131	-15.5	131
49	87	173	4.5	30	80.25	900	132	132
50	83	156	5	13	25	169	6.5	133
51	16	115	-6.5	-38	48.25	784	185	134
52	88	185	3.5	-17	15.25	289	-59.5	135
53	30	173	7.5	30	56.25	900	225	136
54	16	143	-6.5	0	48.25	0	0	137
55	83	114	5	-23	25	841	-14.5	138
56	17	143	-5.5	-1	30.25	1	5.5	139
57	83	147	5	4	25	16	-5	140
58	87	107	4.5	-36	80.25	1336	168	141
59	--	--	--	--	--	--	--	142
60	87	180	4.5	37	80.25	1569	166.5	143
61	10	139	-18.5	-4	156.25	16	30	144
62	15	181	-7.5	8	56.25	64	-80	145
63	33	167	9.5	84	80.25	276	838	146
64	83	184	5	-19	25	361	-9.5	147
65	7	152	-15.5	-8	840.25	64	154	148
66	80	137	5.5	14	8.25	196	-38	149
67	18	119	-4.5	-84	80.25	276	108	150
68	87	163	4.5	19	80.25	361	82.5	151
69	13	138	-10.5	-5	110.25	25	52.5	152
70	11	133	-9.5	-11	90.25	121	104.5	153
71	19	187	-3.5	14	15.25	196	-49	154
72	88	168	5.5	83	80.25	682	137.5	155
73	85	133	3.5	-11	8.25	161	-37.5	156
74	84	133	1.5	-11	8.25	161	-16.5	157
75	85	137	5	-16	25	326	8	158
76	17	156	-5.5	-17	30.25	289	93.5	159
77	88	178	5.5	35	30.25	1325	193.5	160
78	89	154	6.5	11	42.25	161	71.5	161
79	80	131	-5.5	-15	8.25	144	30	162
80	84	154	1.5	11	8.25	161	16.5	163
81	88	166	5.5	33	30.25	289	126.5	164
82	84	99	1.5	-44	8.25	1336	-66	165
83	86	154	3.5	11	15.25	161	58.5	166
84	85	169	3.5	36	8.25	676	66	167
85	18	146	-4.5	5	80.25	25	-82.5	168
86	17	136	-5.5	-7	30.25	49	-58.5	169
87	30	157	7.5	-16	56.25	225	-150	170
88	87	153	4.5	15	80.25	225	67.5	171
89	13	140	-9.5	-3	90.25	9	52.5	172
90	87	167	4.5	34	80.25	276	108	173
91	16	155	-4.5	18	80.25	144	-54	174
92	16	139	-6.5	-4	42.25	16	56	175
93	84	157	1.5	44	8.25	1336	66	176
94	83	163	5	40	8.25	1600	80	177
95	35	155	9.5	35	80.25	484	209	178

TABLE IV c

No.	X	Y	x	y	x^2	y^2	xy
96	27	136	4.5	- 7	20.25	49	- 31.5
97	28	122	5.5	-21	30.25	441	-115.5
98	29	147	6.5	4	42.25	16	26.
99	27	164	4.5	21	20.25	441	94.5
100	20	134	- 2.5	- 9	6.25	81	22.5
101	30	162	7.5	29	56.25	841	217.5
102	18	126	- 4.5	-17	20.25	289	76.5
103	27	132	4.5	-11	20.25	121	- 49.5
104	11	124	-11.5	-19	132.25	361	218.5
105	27	131	4.5	-12	20.25	144	- 54.
106	22	155	- .5	12	.25	144	- 6.
107	25	129	2.5	-14	6.25	196	- 35.
108	29	150	6.5	7	42.25	49	45.5
109	25	145	2.5	2	6.25	4	5.
110	18	155	- 4.5	12	20.25	144	- 54.
111	28	159	5.5	16	30.25	256	88.
112	28	127	5.5	-16	30.25	256	- 88.
113	20	131	- 2.5	-12	6.25	144	30.
114	31	124	8.5	-19	72.25	361	-161.5
115	31	186	8.5	43	72.25	1849	365.5
116	30	163	7.5	20	56.25	400	150.
117	19	145	- 3.5	2	12.25	4	- 7.
118	21	132	- 1.5	-11	2.25	121	16.5
119	15	124	- 7.5	-19	56.25	361	142.5
120	19	135	- 3.5	- 8	12.25	64	28.
121	32	164	9.5	21	90.25	441	199.5
122	25	170	2.5	27	6.25	729	67.5
123	21	114	- 1.5	-29	2.25	841	43.5
124	15	103	- 7.5	-40	56.25	1600	300.
125	29	153	6.5	10	42.25	100	65.
126	24	176	1.5	33	2.25	1089	49.5
127	29	132	6.5	-11	42.25	121	- 71.5
128	24	105	1.5	-38	2.25	1444	- 57.
129	14	139	- 8.5	- 4	72.25	16	34.
130	30	122	7.5	-21	56.25	441	-157.5
131	30	151	7.5	8	56.25	64	60.
132	22	163	- .5	20	.25	400	- 10.
133	23	120	.5	-23	.25	529	- 11.5
134	20	130	- 2.5	-13	6.25	169	32.5
135	19	120	- 3.5	-23	12.25	529	80.5
136	23	162	.5	19	.25	361	9.5
137	18	148	- 4.5	5	20.25	25	- 22.5
138	27	131	4.5	-12	20.25	144	- 54.
139	23	102	.5	-41	.25	1681	- 20.5
140	20	130	- 2.5	-13	6.25	169	32.5
141	28	157	5.5	14	30.25	196	77.
142	15	136	- 7.5	- 7	56.25	49	52.5
143	28	161	5.5	18	30.25	324	99.
144	9	101	-13.5	-42	182.25	1764	567.

TABLE IV c

No.	X	Y	x	y	X	Y
144	2	101	-15.5	-45	188.5	1764
143	28	161	5.5	18	30.5	534
142	15	156	-7.5	-7	56.5	49
141	88	157	4.5	2	20.5	82.5
140	60	150	-8.5	-13	6.5	169
139	83	108	5	-41	1.5	1691
138	27	151	4.5	-18	20.5	144
137	18	148	-4.5	2	20.5	144
136	52	163	5	19	1.5	361
135	19	150	-3.5	-23	12.5	259
134	80	120	-5.5	-13	6.5	169
133	83	160	5	-23	1.5	529
132	83	163	5	-23	1.5	529
131	20	151	7.5	8	56.5	64
130	30	152	7.5	-81	56.5	441
129	14	139	-8.5	-4	72.5	16
128	24	108	1.5	-38	5.5	1444
127	49	133	6.5	-11	42.5	181
126	84	176	1.5	33	2.5	1089
125	89	153	6.5	10	42.5	100
124	15	103	-7.5	-40	56.5	1600
123	21	114	-1.5	-29	8.5	841
122	85	170	3.5	27	6.5	729
121	33	164	9.5	21	90.5	441
120	19	135	-3.5	-8	12.5	64
119	13	184	-7.5	-19	56.5	361
118	21	153	-1.5	-11	2.5	181
117	19	145	-3.5	3	12.5	4
116	30	165	7.5	20	56.5	400
115	21	186	9.5	43	72.5	1849
114	21	184	9.5	-19	72.5	361
113	20	181	-3.5	-13	6.5	144
112	88	167	5.5	-16	20.5	326
111	28	159	5.5	16	30.5	326
110	18	155	-4.5	13	20.5	144
109	25	145	3.5	3	6.5	4
108	89	150	6.5	7	42.5	49
107	25	159	3.5	-14	6.5	196
106	63	155	5	18	1.5	144
105	27	151	4.5	-18	20.5	144
104	11	184	-11.5	-19	132.5	218.5
103	87	133	4.5	-11	20.5	161
102	18	156	-4.5	-17	20.5	329
101	20	163	7.5	29	56.5	841
100	80	134	-5.5	-9	6.5	81
99	27	164	4.5	21	20.5	441
98	29	147	6.5	4	42.5	16
97	88	165	5.5	-21	30.5	441
96	27	136	4.5	-7	20.5	49

TABLE IV c Class of 1936

No.	X	Y	x	y	x^2	y^2	xy
145	25	120	2.5	-23	6.25	529	- 57.5
146	17	94	- 5.5	-49	30.25	2401	269.5
147	15	126	- 7.5	-17	56.25	289	127.5
148	24	139	1.5	- 4	2.25	16	- 6.
149	24	153	1.5	10	2.25	100	15.
150	21	162	- 1.5	19	2.25	361	- 28.5
151	27	139	4.5	- 4	20.25	16	- 18.
152	30	165	7.5	22	56.25	484	165.
153	25	151	2.5	8	6.25	64	20.
154	18	158	- 4.5	15	20.25	225	- 67.5
155	14	113	- 8.5	-30	72.25	900	255.
156	4	119	-18.5	-24	342.25	576	444.
157	24	132	1.5	-11	2.25	121	- 16.5
158	20	116	- 2.5	-27	6.25	729	67.5
159	31	161	8.5	18	72.25	324	153.
160	26	157	3.5	14	12.25	196	49.
161	21	162	- 1.5	19	2.25	361	- 28.5
162	23	145	.5	2	.25	4	1.
163	29	130	6.5	-13	42.25	169	- 84.5
164	28	145	5.5	2	30.25	4	11.
165	25	149	2.5	6	6.25	36	15.
166	28	138	5.5	- 5	30.25	25	- 27.5
167	22	136	- .5	- 7	.25	49	3.5
168	28	180	5.5	37	30.25	1369	203.5
169	29	154	6.5	11	42.25	121	71.5
170	29	146	6.5	3	42.25	9	19.5
171	13	140	- 9.5	- 3	90.25	9	28.5
172	21	145	- 1.5	2	2.25	4	- 3.
173	18	112	- 4.5	-31	20.25	961	139.5
174	24	169	1.5	26	2.25	676	39.
175	28	148	5.5	5	30.25	25	27.5
176	20	166	- 2.5	23	6.25	529	- 57.5
177	23	145	.5	2	.25	4	1.
178	27	175	4.5	32	20.25	1024	144.
179	21	149	- 1.5	6	2.25	36	- 9.
180	23	168	.5	25	.25	625	12.5
181	17	91	- 5.5	-52	30.25	2704	286.
182	26	127	3.5	-16	12.25	256	- 56.
183	25	185	2.5	42	6.25	1764	105.
184	15	121	- 7.5	-22	56.25	484	165.
185	24	174	1.5	31	2.25	961	46.5
186	26	172	3.5	29	12.25	841	101.5
187	27	166	4.5	23	20.25	529	103.5
188	17	117	- 5.5	-26	30.25	676	143.
189	23	129	.5	-14	.25	196	- 7.
190	28	134	5.5	- 9	30.25	81	49.5
191	16	175	- 6.5	32	42.25	1024	-208.
192	30	139	7.5	- 4	56.25	16	- 30.
193	28	191	5.5	48	30.25	2304	264.

TABLE IV c Class of 1936

No.	X	Y	X	Y	X	Y	X	Y
145	35	180	5.5	-33	8.35	589	-37.5	25
146	17	94	-5.5	-49	30.35	8401	389.5	26
147	15	186	-7.5	-17	58.35	889	187.5	27
148	84	158	1.5	-4	5.35	16	6	28
149	84	183	1.5	10	2.35	100	15	29
150	81	163	-1.5	19	3.35	381	-68.5	30
151	37	158	4.5	-4	30.35	16	-18	31
152	30	165	7.5	35	58.35	484	185	32
153	35	181	3.5	8	6.35	84	30	33
154	18	158	-4.5	15	30.35	385	-67.5	34
155	14	113	-8.5	-30	73.35	900	355	35
156	4	119	-18.5	-84	345.35	878	444	36
157	84	138	1.5	-11	5.35	181	-18.5	37
158	80	116	-8.5	-87	6.35	789	87.5	38
159	31	161	8.5	18	78.35	384	183	39
160	36	157	3.5	14	13.35	186	48	40
161	81	168	-1.5	19	3.35	381	-38.5	41
162	33	145	5	8	1.35	4	1	42
163	39	130	6.5	-15	48.35	189	-84.5	43
164	38	145	2.5	5	30.35	4	11	44
165	35	149	3.5	6	6.35	56	15	45
166	38	158	5.5	-5	30.35	35	-37.5	46
167	35	136	5	-7	1.35	48	3.5	47
168	38	180	5.5	37	30.35	1869	308.5	48
169	39	154	6.5	11	43.35	181	71.5	49
170	35	146	6.5	3	48.35	9	19.5	50
171	15	140	-9.5	-3	30.35	9	38.5	51
172	31	145	-1.5	5	3.35	4	3	52
173	18	113	-4.5	-31	30.35	381	138.5	53
174	34	169	1.5	35	5.35	878	39	54
175	38	148	3.5	5	30.35	35	37.5	55
176	30	166	-3.5	35	6.35	389	-37.5	56
177	35	145	5	3	1.35	4	1	57
178	37	175	4.5	35	30.35	1084	144	58
179	31	149	-1.5	6	3.35	56	6	59
180	35	168	5	35	1.35	889	18.5	60
181	17	91	-5.5	-35	30.35	3704	389	61
182	35	157	3.5	-16	13.35	356	-38	62
183	35	185	3.5	45	6.35	1784	105	63
184	15	181	-7.5	-35	58.35	484	185	64
185	34	174	1.5	31	5.35	381	48.5	65
186	36	175	3.5	39	13.35	841	101.5	66
187	37	166	4.5	35	30.35	589	103.5	67
188	17	117	-5.5	-36	50.35	878	143	68
189	33	159	5	-14	1.35	186	7	69
190	38	134	3.5	-9	30.35	81	48.5	70
191	16	178	-6.5	36	48.35	1084	-308	71
192	30	159	7.5	-4	58.35	16	-30	72
193	38	191	5.5	48	30.35	3304	384	73

TABLE IV c

No.	X	Y	x	y	x^2	y^2	xy
194	10	77	-12.5	-66	156.25	4356	-825.
195	17	134	- 5.5	- 9	30.25	81	49.5
196	20	125	- 2.5	-18	6.25	324	45.
197	31	169	8.5	26	72.25	676	221.
198	26	150	3.5	7	12.25	49	24.5
199	31	161	8.5	18	72.25	324	153.
200	6	112	-16.5	-31	272.25	961	511.5
201	14	143	- 8.5	0	72.25	0	0
202	19	156	- 3.5	13	12.25	169	- 45.5
203	21	134	- 1.5	- 9	2.25	81	13.5
204	24	152	1.5	9	2.25	81	13.5
205	28	133	5.5	-10	30.25	100	- 55.
206	29	186	6.5	43	42.25	1849	279.5
207	27	150	4.5	7	20.25	49	31.5
208	26	172	3.5	29	12.25	841	101.5
209	20	159	- 2.5	16	6.25	256	- 40.
210	25	163	2.5	20	6.25	400	50.
211	28	151	5.5	8	30.25	64	44.
212	17	149	- 5.5	6	30.25	36	- 33.
213	24	170	1.5	27	2.25	729	40.5
214	28	168	5.5	25	30.25	625	137.5
215	17	165	- 5.5	22	30.25	484	-121.
216	30	169	7.5	26	56.25	676	195.
217	15	154	- 7.5	11	56.25	121	- 82.5
218	27	165	4.5	22	20.25	484	99.
219	29	117	6.5	-26	42.25	676	-169.
220	24	149	1.5	6	2.25	36	9.
221	13	146	- 9.5	3	90.25	9	- 28.
222	13	133	- 9.5	-10	90.25	100	95.
223	25	150	2.5	7	6.25	49	17.5
224	28	177	5.5	34	30.25	1156	187.
225	11	122	-11.5	-21	132.25	441	241.5
226	24	132	1.5	-11	2.25	121	16.5
227	22	135	- .5	- 8	.25	64	4.
228	27	157	4.5	14	20.25	196	63.
229	23	139	.5	- 4	.25	16	- 2.
230	19	147	- 3.5	4	12.25	16	- 14.5
231	30	141	7.5	- 2	56.25	4	- 15.
232	31	140	8.5	- 3	72.25	9	- 25.5
233	30	191	7.5	48	56.25	2304	360.
234	19	130	- 3.5	-13	12.25	169	45.5
235	28	127	5.5	-16	30.25	256	- 88.
236	23	157	.5	14	.25	196	7.
237	18	132	- 4.5	-11	20.25	121	49.5
238	31	186	8.5	43	72.25	1849	365.5
239	29	128	6.5	-15	42.25	225	- 97.5
240	16	140	- 6.5	- 3	42.25	9	19.5
241	29	124	6.5	-19	42.25	361	-123.5
242	27	142	4.5	- 1	20.25	1	- 4.5

TABLE IV 5

No.	X	Y	x	y	X	Y
184	10	17	-12.5	-66	156.85	4356
185	17	154	-2.5	-9	30.85	81
186	20	182	-2.5	-18	6.85	384
187	21	168	8.5	26	72.85	676
188	26	150	3.5	7	12.85	49
189	21	161	8.5	18	72.85	384
800	6	112	-16.5	-21	278.85	961
801	14	142	-8.5	0	72.85	0
802	19	156	-3.5	15	12.85	159
803	27	124	-1.5	-9	2.85	81
804	24	128	1.5	9	2.85	81
805	28	132	2.5	-10	30.85	100
806	22	186	2.5	42	42.85	1849
807	27	150	4.5	7	20.85	49
808	26	172	3.5	29	12.85	841
809	20	159	-2.5	16	4.85	256
810	25	162	2.5	20	6.85	400
811	29	151	2.5	8	30.85	64
812	17	149	-2.5	6	30.85	36
813	24	170	1.5	27	2.85	729
814	28	168	2.5	22	30.85	625
815	17	162	-2.5	22	30.85	484
816	20	162	7.5	26	22.85	676
817	12	154	-7.5	11	22.85	161
818	27	162	4.5	22	20.85	464
819	22	117	6.5	-26	42.85	676
820	24	149	1.5	6	2.85	36
821	12	146	-2.5	2	20.85	9
822	12	122	-2.5	-16	20.85	100
823	22	150	2.5	7	4.85	49
824	28	177	2.5	24	30.85	1156
825	11	122	-11.5	-21	122.85	441
826	24	122	1.5	-11	2.85	121
827	28	122	-2.5	-8	2.85	64
828	27	127	4.5	14	20.85	196
829	22	122	2.5	-4	2.85	16
830	18	147	-3.5	4	12.85	16
831	20	141	7.5	-2	22.85	4
832	21	140	8.5	-2	72.85	9
833	20	121	7.5	48	22.85	2504
834	19	120	-3.5	-12	12.85	156
835	28	127	2.5	-16	30.85	256
836	22	127	2.5	14	2.85	196
837	18	122	-4.5	-11	20.85	161
838	21	166	8.5	42	72.85	1849
839	22	128	2.5	-12	42.85	256
840	16	140	-2.5	-2	42.85	9
841	29	124	6.5	-19	42.85	361
842	27	142	4.5	-1	20.85	1

TABLE IV c

No.	X	Y	x	y	x ²	y ²	xy
243	30	187	7.5	44	56.25	1936	330.
244	32	139	9.5	- 4	90.25	16	- 38.
245	26	169	3.5	26	12.25	676	91.
246	23	168	.5	25	.25	625	12.5
247	25	126	2.5	-17	6.25	289	- 42.5
248	25	157	2.5	14	6.25	196	35.
249	14	100	- 8.5	-43	72.25	1849	365.5
250	29	166	6.5	23	42.25	529	149.5
251	25	160	2.5	17	6.25	289	42.5
252	27	160	4.5	17	20.25	289	76.5
253	29	155	6.5	12	42.25	144	78.
254	26	148	3.5	5	12.25	25	17.5
255	29	129	6.5	-14	42.25	196	- 91.
256	22	129	- .5	-14	.25	196	7.
257	27	142	4.5	- 1	20.25	1	- 4.5
258	7	120	-15.5	-23	240.25	529	356.5
259	21	154	- 1.5	11	2.25	121	- 16.5
260	24	153	1.5	10	2.25	100	15.
261	17	141	- 5.5	- 2	30.25	4	11.
262	17	97	- 5.5	-46	30.25	2116	253.
263	9	142	-13.5	- 1	182.25	1	13.5
264	13	112	- 9.5	-31	90.25	961	294.5
265	8	91	-14.5	-52	210.25	2704	754.
266	16	106	- 6.5	-37	42.25	1369	240.5
267	11	156	-11.5	13	132.25	169	-149.5
268	18	108	- 4.5	-35	20.25	1225	157.5
269	15	152	- 7.5	9	56.25	81	- 67.5
270	12	142	-10.5	- 1	110.25	1	10.5
271	18	144	- 4.5	1	20.25	1	- 4.5
272	23	124	.5	-19	.25	361	- 9.5
273	12	174	-10.5	31	110.25	961	-325.5
274	11	119	-11.5	-24	132.25	576	276.
275	24	134	1.5	- 9	2.25	81	- 13.5
276	25	144	2.5	1	6.25	1	2.5
277	12	74	-10.5	-69	110.25	4761	724.5
278	26	109	3.5	-34	12.25	1156	-119.
279	5	120	-17.5	-23	306.25	529	402.5
280	13	117	- 9.5	-26	90.25	676	247.
281	13	162	- 9.5	19	90.25	361	-180.5
279	6,278	39,898			10,793.75	131,898	16,153.
	22.5	143					

TABLE IV

No.	X	Y	X	Y	X	Y	X	Y
243	30	187	7.5	44	32.32	1321	32.32	1321
244	32	123	8.8	- 8	30.32	121	30.32	121
245	32	123	8.8	32	12.32	272	12.32	272
246	32	123	8.	32	32.	22	32.	22
247	32	123	8.8	-17	22.3	222	22.3	222
248	32	123	8.8	14	22.3	121	22.3	121
249	14	100	- 8.8	-42	22.37	1242	22.37	1242
250	32	123	8.8	32	22.32	222	22.32	222
251	32	123	8.8	17	22.3	222	22.3	222
252	37	123	4.8	17	20.02	222	20.02	222
253	32	123	8.8	12	22.32	121	22.32	121
254	32	123	8.8	2	12.32	22	12.32	22
255	32	123	8.8	-14	22.32	121	22.32	121
256	32	123	8.	-14	22.	121	22.	121
257	27	142	4.8	- 1	20.32	1	20.32	1
258	7	120	-12.8	-22	240.32	222	240.32	222
259	21	124	- 1.2	11	22.3	121	22.3	121
260	22	122	1.2	10	22.32	100	22.32	100
261	17	141	- 2.2	- 8	20.32	4	20.32	4
262	17	97	- 2.2	-42	20.32	212	20.32	212
263	2	142	-12.2	- 1	122.32	1	122.32	1
264	12	112	- 2.2	-21	20.32	121	20.32	121
265	2	91	-14.2	-22	210.32	272	210.32	272
266	12	102	- 2.2	-27	22.32	122	22.32	122
267	11	122	-11.2	12	122.32	122	122.32	122
268	12	102	- 4.2	-22	20.32	122	20.32	122
269	12	122	- 7.2	2	22.32	21	22.32	21
270	12	142	-10.2	- 1	110.32	1	110.32	1
271	12	144	- 4.2	1	20.32	1	20.32	1
272	27	124	2.	-12	22.	121	22.	121
273	12	124	-10.2	21	110.32	121	110.32	121
274	11	112	-11.2	-24	122.32	272	122.32	272
275	24	124	1.2	- 2	22.32	21	22.32	21
276	22	142	2.2	1	22.3	1	22.3	1
277	12	92	-10.2	-22	110.32	122	110.32	122
278	22	102	2.2	-24	12.32	112	12.32	112
279	2	120	-17.2	-22	202.32	222	202.32	222
280	12	117	- 2.2	-22	20.32	272	20.32	272
281	12	122	- 2.2	12	20.32	121	20.32	121
		22.2			10, 22.2			10, 22.2
		123			22.2			22.2

TABLE IV c

The calculation for the coefficient of correlation follows:

$$r = \frac{\sum xy}{\sqrt{\sum x^2} \times \sqrt{\sum y^2}} \quad \text{substituting } r = \frac{16,153}{\sqrt{10,793.75} \times \sqrt{131,898.}}$$

$$r = \frac{16,153}{103.9 \times 363.2} = \frac{16,153}{37,736.5} = 0.428$$

$$\text{The Probable Error} = \frac{.6745 \times (1 - r^2)}{\sqrt{N}}$$

$$PE_r = \frac{.6745 \times (1 - 0.1832)}{\sqrt{279}} = \frac{.5509}{16.67} = .033$$

TABLE IV c

The calculation for the coefficient of correlation follows:

$$r = \frac{\sum x_i y_i}{\sqrt{\sum x_i^2 \sum y_i^2}} = \frac{16,153}{\sqrt{10,738.6 \times 27,736.6}}$$

$$r = \frac{16,153}{\sqrt{10,738.6 \times 27,736.6}} = \frac{16,153}{546.0} = 0.488$$

$$\text{The Probable Error} = \frac{.6745 \times (1 - r^2)}{\sqrt{n}}$$

$$P.E. = \frac{.6745 \times (1 - 0.1832)}{\sqrt{16.67}} = \frac{.5509}{4.08} = 0.135$$

TABLE IV d Class of 1935

Correlation of Army Alpha scores and College Algebra test scores

No.	X	Y	x	y	x^2	y^2	xy
35-1	14	150	- 8	9.6	64	92.16	- 76.8
2	26	169	4	28.6	16	817.96	114.4
3	23	131	1	- 9.4	1	88.36	- 9.4
4	19	145	- 3	4.6	9	21.16	-13.8
5	19	139	- 3	- 1.4	9	1.96	4.2
6	32	154	10	13.6	100	184.96	136.
7	23	108	1	-32.4	1	1049.76	- 32.4
8	21	138	- 1	- 2.4	1	5.76	2.4
9	25	129	3	-11.4	9	129.96	- 34.2
10	29	143	7	2.6	49	6.76	18.2
11	21	123	1	-17.4	1	302.76	- 17.4
12	27	149	5	8.6	25	73.96	43.
13	22	135	0	- 5.4	0	29.16	0
14	18	124	- 4	-16.4	16	268.96	65.6
15	12	138	-10	- 2.4	100	5.76	24.
16	20	140	- 2	- .4	4	.16	.8
17	25	125	3	-15.4	9	237.16	- 46.2
18	26	132	4	- 8.4	16	70.56	- 33.6
19	31	136	9	- 4.4	81	19.36	- 39.6
20	23	150	1	9.6	1	92.16	9.6
21	31	162	9	21.6	81	466.56	194.4
22	29	138	7	- 2.4	49	5.76	- 16.8
23	24	136	2	- 4.4	4	19.36	- 8.8
24	15	141	- 7	.6	49	.36	- 4.2
25	20	140	- 2	- .4	4	.16	.8
26	24	184	2	43.6	4	1900.96	87.2
27	28	175	6	34.6	36	1197.16	207.6
28	32	113	10	-27.4	100	750.76	-274.
29	28	133	6	- 7.4	36	54.76	- 44.4
30	27	163	5	22.6	25	510.76	113.
31	28	153	6	12.6	36	158.76	75.6
32	23	153	1	12.6	1	158.76	12.6
33	29	122	7	-18.4	49	338.76	-128.8
34	24	144	2	3.6	4	12.96	7.2
35	30	180	8	39.6	64	1568.16	316.8
36	28	123	6	-17.4	36	302.76	-104.4
37	17	109	- 5	-31.4	25	985.96	157.
38	28	134	6	- 6.4	36	40.96	- 38.4
39	14	147	- 8	6.6	64	43.56	- 52.8
40	12	114	-10	-26.4	100	696.96	264.
41	21	144	- 1	3.6	1	12.96	- 3.6
42	27	174	5	33.6	25	1228.96	168.
43	15	157	- 7	16.6	49	275.56	-116.2
44	17	136	- 5	- 4.4	25	19.36	22.
45	14	140	- 8	- .4	64	.16	3.2
46	20	137	- 2	- 3.4	4	11.56	6.8
47	23	124	1	-16.4	1	268.96	- 16.4

TABLE IV b
Class of 1935

Correlation of Army Alpha scores and College Algebra test scores

No.	X	Y	X	Y	X	Y	XY
25-1	14	150	8	8.5	84	68.15	- 75.8
2	26	159	4	28.5	15	81.95	115.4
3	23	131	1	- 9.4	1	88.35	- 9.4
4	19	145	3	4.5	9	31.15	-15.8
5	19	139	3	- 1.4	9	1.95	4.5
6	32	154	10	13.5	100	184.95	135.
7	23	108	1	-22.4	1	1049.75	- 32.4
8	21	138	- 1	- 8.4	1	5.75	3.4
9	25	129	3	-11.4	9	129.95	- 34.8
10	29	143	7	3.5	49	6.75	18.3
11	21	123	1	-17.4	1	308.75	- 17.4
12	27	149	5	8.5	25	73.95	45.
13	22	135	0	- 2.4	0	39.15	0
14	18	124	- 4	-15.4	15	238.95	65.5
15	15	138	-10	- 3.4	100	5.75	24.
16	20	140	2	4.	4	1.5	8.
17	22	158	3	-12.4	9	237.15	- 45.3
18	26	132	4	- 8.4	15	70.55	- 33.5
19	31	155	9	- 4.4	81	19.35	- 39.5
20	28	150	1	9.5	1	32.15	5.5
21	31	162	9	21.5	81	455.25	124.4
22	29	158	7	- 3.5	49	5.75	- 15.3
23	24	135	2	- 4.4	4	19.35	- 5.8
24	15	141	- 7	5.	49	38.	- 4.2
25	20	140	- 2	4.	4	1.5	8.
26	24	184	8	43.5	4	1900.95	87.3
27	28	175	5	34.5	25	1197.15	207.5
28	32	113	10	-27.4	100	790.75	-274.
29	29	133	5	- 7.4	25	54.75	- 44.4
30	27	153	2	22.5	25	210.75	113.
31	28	152	5	12.5	25	136.75	75.5
32	25	153	1	12.5	1	158.75	15.5
33	29	122	7	-18.4	49	238.75	-122.8
34	24	144	3	3.5	4	12.95	7.3
35	20	180	8	39.5	64	1268.15	315.8
36	28	122	5	-17.4	25	302.75	-104.4
37	17	109	- 2	-21.4	25	282.95	127.
38	28	134	5	- 5.4	25	40.95	- 38.4
39	14	147	- 8	8.5	64	43.55	- 25.8
40	13	114	-10	-25.4	100	595.95	234.
41	21	144	- 1	3.5	1	12.95	- 3.5
42	27	174	2	33.5	25	1885.25	153.
43	15	157	- 7	15.5	49	275.25	-115.3
44	17	155	- 2	- 4.4	25	12.35	22.
45	14	140	- 8	4.	64	1.5	5.3
46	20	157	- 3	- 3.5	4	11.55	5.8
47	23	124	1	-15.4	1	228.95	- 15.4

TABLE IV d (1935)

No.	X	Y	x	y	x ²	y ²	xy
48	30	173	8	32.6	64	1062.76	-260.8
49	31	176	9	35.6	81	1267.36	320.4
50	25	158	3	17.6	9	309.76	52.8
51	27	162	5	21.6	25	466.56	108.
52	18	118	- 4	-22.4	16	501.76	89.6
53	25	153	3	12.6	9	158.76	37.8
54	20	123	- 2	-17.4	4	302.76	34.8
55	29	103	7	-37.4	49	1398.76	-261.8
56	25	111	3	-29.4	9	864.36	- 88.2
57	21	116	- 1	-24.4	1	595.36	24.4
58	19	156	- 3	15.6	9	243.36	- 46.8
59	29	137	7	- 3.4	49	11.56	- 23.8
60	21	145	- 1	4.6	1	21.16	- 4.6
61	4	122	-18	-18.4	324	338.56	331.2
62	29	147	7	6.6	49	43.56	46.2
63	11	173	-11	32.6	121	1062.76	-258.6
64	27	118	5	-22.4	25	501.76	-112.
65	5	129	-17	-11.4	289	129.96	193.8
66	20	171	- 2	30.6	4	936.36	- 61.2
67	22	135	0	- 5.4	0	29.16	0
68	31	163	9	22.6	81	510.76	203.4
69	9	142	-13	1.6	169	2.56	- 20.8
70	23	157	1	16.6	1	275.56	16.6
71	13	150	- 9	9.6	81	92.16	- 86.4
72	24	178	2	37.6	4	1413.76	75.2
73	25	158	3	17.6	9	309.76	52.8
74	30	166	8	25.6	64	655.36	204.8
75	22	167	0	26.6	0	707.56	0
76	13	129	- 9	-11.4	81	129.96	102.6
77	20	123	- 2	-17.4	4	302.76	34.8
78	20	162	- 2	21.6	4	466.56	- 43.2
79	13	130	- 9	-10.4	81	108.16	93.6
80	24	138	2	- 2.4	4	5.76	- 4.8
81	16	125	- 6	-15.4	36	237.16	92.4
82	27	147	5	6.6	25	43.56	33.
83	21	147	- 1	6.6	1	43.56	- 6.6
84	24	117	2	-23.4	4	547.56	- 46.8
85	26	150	4	9.6	16	92.16	38.4
86	30	158	8	17.6	64	309.76	140.8
87	10	180	-12	39.6	144	1568.16	-475.2
88	25	135	3	- 5.4	9	29.16	- 16.2
89	--	---	---	----	---	-----	-----
90	22	78	0	-62.4	0	3893.76	0
91	19	150	- 3	9.6	9	92.16	- 28.8
92	26	156	4	15.6	16	243.36	62.4
93	11	129	-11	-11.4	121	129.96	125.4
94	25	142	3	1.6	9	2.56	4.8
95	26	166	4	25.6	16	655.36	102.4
96	23	100	1	-40.4	1	1632.16	- 40.4

TABLE IV 6 (1935)

No.	X	Y	X	Y	X	Y	X	Y
48	30	173	8	38.8	44	-1083.78	8	-280.8
49	31	178	9	39.8	81	-1381.38	9	-280.4
50	32	183	3	17.8	9	308.78	3	32.8
51	37	188	3	31.8	38	488.38	3	108.8
52	18	118	-	-38.4	18	301.78	8	82.8
53	38	193	3	18.8	9	158.78	3	37.8
54	30	183	-	-17.4	4	308.78	8	34.8
55	39	103	7	-37.4	49	1388.78	8	-181.8
56	38	111	3	-39.4	9	884.38	-	-88.8
57	31	118	-	-24.4	1	388.38	8	84.4
58	19	188	-	18.8	9	343.38	-	-48.8
59	39	137	7	-3.4	49	11.38	-	-33.8
60	31	143	-	4.8	1	31.18	-	4.8
61	4	183	-18	-18.4	384	388.38	3	381.8
62	39	147	7	8.8	49	43.38	8	48.8
63	11	178	-11	38.8	181	1083.78	-	-388.8
64	37	118	3	-38.4	38	801.78	-	-118.8
65	3	189	-17	-11.4	889	188.98	8	188.8
66	30	171	-	30.8	4	338.38	-	-61.8
67	38	183	0	-2.4	0	39.18	0	0
68	31	183	9	38.8	81	810.78	8	803.4
69	3	143	-13	1.8	189	8.38	-	-303.8
70	33	187	1	18.8	1	378.38	8	18.8
71	13	180	-	9.8	81	93.18	-	-88.4
72	34	178	3	37.8	4	1413.78	8	73.8
73	38	188	3	17.8	9	303.78	8	38.8
74	30	168	8	38.8	84	888.38	8	804.8
75	38	187	0	38.8	0	707.38	0	0
76	18	189	-	-11.4	81	189.98	8	108.8
77	30	183	-	-17.4	4	303.78	8	34.8
78	30	188	-	31.8	4	488.38	-	-48.8
79	18	180	-	-10.8	81	108.18	8	88.8
80	34	188	3	-3.4	4	3.78	-	4.8
81	18	183	-	-18.4	38	837.18	8	88.4
82	37	147	3	8.8	38	43.38	3	33.8
83	31	147	-	8.8	1	48.38	-	8.8
84	34	117	3	-38.4	4	347.38	-	-48.8
85	38	180	4	9.8	18	93.18	8	58.4
86	30	188	8	17.8	84	803.78	8	140.8
87	10	180	-18	38.8	144	1888.18	-	-473.8
88	38	188	3	-3.4	9	38.18	-	-18.8
89	-	-	-	-	-	-	-	-
90	39	78	0	-82.4	0	3883.78	0	0
91	19	180	-	8.8	9	93.18	-	-38.8
92	38	188	4	18.8	18	843.38	8	88.4
93	11	189	-11	-11.4	181	189.98	8	188.4
94	38	143	3	1.8	9	8.38	8	4.8
95	38	188	4	38.8	18	888.38	8	103.4
96	33	100	1	-40.4	1	1883.18	-	-40.4

TABLE IV d (1935)

NO.	X	Y	x	y	x ²	y ²	xy
97	13	123	- 9	-17.4	81	302.76	156.6
98	20	134	1	- 6.4	1	40.96	- 6.4
99	26	96	4	-44.4	16	1971.36	-177.6
100	11	147	-11	6.6	121	43.56	- 72.6
101	25	134	3	- 6.4	9	40.96	- 19.2
102	15	123	- 7	-17.4	49	302.76	121.8
103	29	118	7	-22.4	49	501.76	-156.8
104	25	143	3	2.6	9	6.76	7.8
105	23	129	1	-11.4	1	129.96	- 11.4
106	17	146	- 5	5.6	25	31.36	- 28.
107	26	105	4	-35.4	16	1253.16	-141.6
108	18	168	- 4	27.6	16	761.76	-110.4
109	26	152	4	11.6	16	134.56	46.4
110	26	150	4	9.6	16	92.16	38.4
111	27	132	5	- 8.4	25	70.56	- 42.
112	25	128	3	-12.4	9	153.76	- 37.2
113	32	100	10	-40.4	100	1632.16	-404.
114	14	185	- 8	44.6	64	1989.16	-356.8
115	28	170	6	29.6	36	876.16	177.6
116	24	150	2	9.6	4	92.16	19.2
117	25	161	3	20.6	9	424.36	61.8
118	8	129	-14	-11.4	196	129.96	159.6
119	24	152	2	11.6	4	134.56	23.2
120	29	162	7	21.6	49	466.56	151.2
121	30	149	8	8.6	64	73.96	68.8
122	18	132	- 4	- 8.4	16	70.56	33.6
123	18	128	- 4	-12.4	16	153.76	49.6
124	15	139	- 7	- 1.4	49	1.96	9.8
125	20	147	- 2	6.6	4	43.56	- 13.2
126	23	129	1	-11.4	1	129.96	- 11.4
127	10	137	-12	- 3.4	144	11.56	40.8
128	27	182	5	41.6	25	1730.56	208.
129	29	111	7	-29.4	49	864.36	-205.8
130	25	144	3	3.6	9	12.96	10.8
131	32	150	10	9.6	100	92.16	96.
132	21	166	- 1	25.6	1	655.36	- 25.6
133	21	150	- 1	9.6	1	92.16	- 9.6
134	26	146	4	5.6	16	31.36	22.4
135	28	147	6	6.6	36	43.56	39.6
136	28	147	6	6.6	36	43.56	39.6
137	21	154	- 1	13.6	1	184.96	- 13.6
138	15	113	- 7	-27.4	49	750.76	191.8
139	25	94	3	-46.4	9	2152.96	139.2
140	23	135	1	- 5.4	1	29.16	- 5.4
141	24	172	2	31.6	4	998.56	63.2
142	11	102	-11	-38.4	121	1474.56	422.4
143	28	136	6	- 4.4	36	19.36	- 26.4
144	18	105	- 4	-35.4	16	1253.16	141.6
145	26	135	4	- 5.4	16	29.16	- 21.6

TABLE IV d (1935)

NO.	X	Y	X'	Y'	X ²	Y ²	XY
143	86	135	4	-2.4	16	59.16	-21.6
144	18	105	-4	-35.4	16	1333.16	-141.6
145	38	136	6	-4.4	36	19.36	-26.4
146	88	147	6	6.6	36	43.56	39.6
147	88	147	6	6.6	36	43.56	39.6
148	11	108	-11	-38.4	121	1474.56	-422.4
149	34	175	8	31.6	64	998.56	252.8
150	34	175	8	31.6	64	998.56	252.8
151	10	137	-12	-3.4	144	11.56	-40.8
152	32	169	1	-11.4	1	129.96	-11.4
153	80	167	6	6.6	36	43.56	39.6
154	12	155	-7	-12.4	49	153.76	-86.8
155	18	188	-4	-12.4	16	153.76	-86.8
156	18	133	-4	-8.4	16	70.56	-33.6
157	30	149	8	8.6	64	73.96	68.8
158	24	165	7	31.6	49	998.56	251.2
159	39	111	7	-32.4	49	864.36	-250.8
160	32	144	3	3.6	9	12.96	10.8
161	36	180	10	3.6	100	36.16	96
162	37	166	1	-22.6	1	409.56	-22.6
163	37	166	1	-22.6	1	409.56	-22.6
164	86	146	6	3.6	36	37.36	21.6
165	86	146	6	3.6	36	37.36	21.6
166	36	147	6	6.6	36	43.56	39.6
167	36	147	6	6.6	36	43.56	39.6
168	12	113	-7	-13.6	49	184.96	-94.8
169	35	84	3	-46.4	9	2128.96	-155.2
170	33	135	1	-2.4	1	59.16	-2.4
171	34	175	8	31.6	64	998.56	252.8
172	34	175	8	31.6	64	998.56	252.8
173	18	188	-4	-12.4	16	153.76	-86.8
174	18	188	-4	-12.4	16	153.76	-86.8
175	36	180	10	3.6	100	36.16	96
176	36	180	10	3.6	100	36.16	96
177	36	180	10	3.6	100	36.16	96
178	36	180	10	3.6	100	36.16	96
179	36	180	10	3.6	100	36.16	96
180	36	180	10	3.6	100	36.16	96
181	36	180	10	3.6	100	36.16	96
182	36	180	10	3.6	100	36.16	96
183	36	180	10	3.6	100	36.16	96
184	36	180	10	3.6	100	36.16	96
185	36	180	10	3.6	100	36.16	96
186	36	180	10	3.6	100	36.16	96
187	36	180	10	3.6	100	36.16	96
188	36	180	10	3.6	100	36.16	96
189	36	180	10	3.6	100	36.16	96
190	36	180	10	3.6	100	36.16	96
191	36	180	10	3.6	100	36.16	96
192	36	180	10	3.6	100	36.16	96
193	36	180	10	3.6	100	36.16	96
194	36	180	10	3.6	100	36.16	96
195	36	180	10	3.6	100	36.16	96
196	36	180	10	3.6	100	36.16	96
197	36	180	10	3.6	100	36.16	96
198	36	180	10	3.6	100	36.16	96
199	36	180	10	3.6	100	36.16	96
200	36	180	10	3.6	100	36.16	96

TABLE IV d (1935)

No.	X	Y	x	y	x^2	y^2	xy
146	12	98	-10	-42.4	100	1797.76	424.8
147	29	177	7	36.6	49	1339.56	256.2
148	9	146	-13	5.6	169	31.36	- 72.8
149	17	136	- 5	- 4.4	25	19.36	22.
150	2	150	-20	9.6	400	92.16	-192.
151	4	126	-18	-14.4	324	207.36	259.2
152	19	121	- 3	-19.4	9	376.36	58.2
153	29	175	7	34.6	49	1197.16	242.2
154	27	157	5	6.6	25	43.56	33.
155	8	126	-14	-14.4	196	207.36	201.6
156	16	113	- 6	-27.4	36	750.76	164.4
157	31	102	9	-38.4	81	1474.56	345.6
158	31	149	9	8.6	81	73.96	77.4
159	24	180	2	39.6	4	1268.16	79.2
160	15	149	- 7	8.6	49	73.96	- 60.2
161	16	156	- 6	15.6	36	243.36	- 93.6
162	15	153	- 7	12.6	49	158.76	- 88.2
163	27	136	5	- 4.4	25	19.36	- 22.
164	9	101	-13	-39.4	169	1552.96	512.2
165	25	121	3	-19.4	9	376.36	- 58.2
166	27	148	5	7.6	25	57.76	38.
167	23	134	1	- 6.4	1	40.96	- 6.4
168	18	158	- 4	17.6	16	309.76	- 70.4
169	16	109	- 6	-31.4	36	985.96	188.4
170	30	145	8	4.6	64	21.16	36.8
171	16	136	- 6	- 4.4	36	19.36	26.4
172	31	156	9	15.6	81	243.36	140.4
173	25	107	3	-33.4	9	1115.56	-100.2
174	30	150	8	9.6	64	92.16	76.8
175	24	105	2	-35.4	4	1253.16	- 70.8
176	23	129	1	-11.4	1	129.96	- 11.4
177	22	138	0	- 2.4	0	5.76	- 0
178	27	166	5	25.6	25	655.26	128.
179	27	183	5	42.6	25	1814.76	213.
180	29	155	7	14.6	49	213.16	102.2
181	13	125	- 9	-15.4	81	237.16	138.6
182	23	127	1	-13.4	1	179.56	- 13.4
183	15	110	- 7	-30.4	49	924.16	212.8
184	18	139	- 4	- 1.4	16	1.96	5.6
185	19	146	- 3	5.6	9	31.36	- 16.8
186	32	158	10	17.6	100	309.76	176.
187	32	120	10	-20.4	100	416.16	-204.
188	28	177	6	36.6	36	1339.56	219.6
189	24	156	2	15.6	4	243.36	31.2
190	20	134	- 2	- 6.4	4	40.96	12.8
191	16	116	- 6	-24.4	36	595.36	146.4
192	20	169	- 2	28.6	4	817.36	- 57.2
193	21	101	- 1	-39.4	1	1552.36	39.4
194	30	165	8	24.6	64	605.16	196.8

TABLE IV 6 (1955)

No.	X	Y	X	Y	X	Y	X	Y
144	30	185	8	84.6	64	605.16	186.8	186.8
145	51	101	-1	-39.4	1	1532.36	39.4	39.4
146	50	169	-2	-38.6	4	817.36	-37.8	-37.8
147	16	116	-6	-84.4	36	596.36	146.4	146.4
148	80	134	-2	-6.4	4	40.36	13.8	13.8
149	84	186	2	12.6	4	843.36	31.2	31.2
150	80	134	-2	-6.4	4	40.36	13.8	13.8
151	16	116	-6	-84.4	36	596.36	146.4	146.4
152	32	158	10	17.6	100	309.76	176.	176.
153	38	130	10	-20.4	100	416.16	-80.4	-80.4
154	58	177	6	36.6	36	1332.36	319.6	319.6
155	84	186	2	12.6	4	843.36	31.2	31.2
156	18	108	-6	-31.4	36	985.36	198.4	198.4
157	18	158	-4	-17.6	16	309.76	-70.4	-70.4
158	33	134	1	-6.4	1	40.36	6.4	6.4
159	57	148	2	7.6	36	57.76	38.	38.
160	57	148	2	7.6	36	57.76	38.	38.
161	16	136	-6	-12.6	36	845.36	-32.6	-32.6
162	13	193	-7	-12.6	49	158.76	-38.3	-38.3
163	27	136	6	4.4	32	19.36	-32.	-32.
164	9	101	-13	-39.4	169	1352.36	313.5	313.5
165	27	181	2	-19.4	9	376.36	-38.3	-38.3
166	57	148	2	7.6	36	57.76	38.	38.
167	33	134	1	-6.4	1	40.36	6.4	6.4
168	18	158	-4	-17.6	16	309.76	-70.4	-70.4
169	16	108	-6	-31.4	36	985.36	198.4	198.4
170	30	146	6	4.6	64	81.16	56.8	56.8
171	16	136	-6	-4.4	36	19.36	56.4	56.4
172	31	156	9	12.6	81	243.36	140.4	140.4
173	52	107	2	-23.4	9	112.36	-100.2	-100.2
174	30	180	8	9.6	64	96.16	76.8	76.8
175	54	103	6	-35.4	4	1582.16	-70.8	-70.8
176	63	129	1	-11.4	1	189.36	-11.4	-11.4
177	52	138	0	-2.4	0	2.76	0	0
178	57	166	2	22.6	32	652.36	138.	138.
179	57	166	2	22.6	32	652.36	138.	138.
180	59	122	7	14.6	49	813.16	108.2	108.2
181	12	152	-9	-12.4	81	827.16	158.8	158.8
182	52	137	1	-12.4	1	179.36	-12.4	-12.4
183	12	110	-7	-30.4	49	924.16	312.8	312.8
184	18	139	-4	-1.4	16	1.36	2.6	2.6
185	19	146	-3	-2.6	9	21.36	-18.8	-18.8
186	32	158	10	17.6	100	309.76	176.	176.
187	38	130	10	-20.4	100	416.16	-80.4	-80.4
188	58	177	6	36.6	36	1332.36	319.6	319.6
189	84	186	2	12.6	4	843.36	31.2	31.2
190	80	134	-2	-6.4	4	40.36	13.8	13.8
191	16	116	-6	-84.4	36	596.36	146.4	146.4
192	50	169	-2	-38.6	4	817.36	-37.8	-37.8
193	51	101	-1	-39.4	1	1532.36	39.4	39.4
194	30	185	8	84.6	64	605.16	186.8	186.8

TABLE IV d (1935)

No.	X	Y	x	y	x ²	y ²	xy
195	15	122	- 7	-18.4	49	338.56	128.8
194	4,277	27,246			8,292	87,999.44	6,539.
	22.	140.4					

Using the values from the preceding table and Garrett's equation, the correlation is found as follows:

$$r = \frac{\sum xy}{\sqrt{\sum x^2} \times \sqrt{\sum y^2}}$$

$$r = \frac{6,539}{\sqrt{8292.} \times \sqrt{87,999.4}} = \frac{6,539}{91.06 \times 296.6}$$

$$r = \frac{6,539}{27,008} = .242$$

The probable error is: $P.E._r = \frac{.6745 \times (1 - r^2)}{\sqrt{N}}$

$$PE = \frac{.6745 \times (1 - .0576)}{\sqrt{194}} = \frac{.6745 \times .942}{13.93} = \frac{.6340}{13.93} = .045$$

TABLE IV 5 (1935)

No.	X	Y	x	y	X ²	Y ²	XY
193	15	132	-7	-18.4	49	338.56	128.8
194	14.4	140.4			8,332	87,999.44	6,539

Using the values from the preceding table and Garrett's equation, the correlation is found as follows:

$$r = \frac{\sum xy}{\sqrt{\sum x^2} \sqrt{\sum y^2}}$$

$$r = \frac{6,539}{\sqrt{8,332} \times \sqrt{87,999.44}} = \frac{6,539}{91.08 \times 296.6} = .242$$

$$r = \frac{6,539}{87,008} = .242$$

The probable error is: $P.E. = \frac{.6745 \times (1 - r^2)}{\sqrt{N}}$

$$P.E. = \frac{.6745 \times (1 - .0576)}{\sqrt{194}} = \frac{.6745 \times .942}{13.93} = .045$$

TABLE IV e Class of 1934

Correlation of Army Alpha and Algebra Placement Test Scores

No.	X	Y	x	y	x ²	y ²	xy
24-1	29	199	6.2	53.5	38.44	2862.25	331.7
2	23	146	.2	.5	.4	.25	.1
3	20	110	- 2.8	-35.5	7.48	1260.25	99.4
4	9	135	-13.8	-10.5	190.44	110.25	144.9
5	31	163	8.2	17.5	67.24	306.25	143.5
6	28	140	5.2	- 5.5	27.04	30.25	- 28.6
7	26	123	3.2	- 2.5	10.24	506.25	- 72.
8	6	131	-16.8	-14.5	282.24	210.25	243.6
9	27	128	4.2	-17.5	17.64	306.25	- 73.5
10	20	149	- 2.8	3.5	5.76	12.25	- 9.8
11	25	183	2.2	37.5	4.84	1406.25	82.5
12	25	111	2.2	-34.5	4.84	1190.25	- 75.9
13	25	148	2.2	2.5	4.84	6.25	5.5
14	27	180	4.2	34.5	17.64	1190.25	144.9
15	26	138	3.2	- 7.5	10.24	56.25	- 24.
16	19	164	- 3.8	18.5	14.44	342.25	- 70.3
17	21.	153	- 1.8	7.5	3.24	56.25	- 13.5
18	22	153	- .8	7.5	.64	56.25	- 6.
19	25	152	2.2	6.5	4.84	42.25	14.3
20	19	120	- 3.8	-25.5	14.44	650.25	85.5
21	18	167	- 4.8	21.5	23.04	462.25	-103.2
22	17	145	- 5.8	.5	33.64	.25	2.9
23	28	172	5.2	26.5	27.04	702.25	137.8
24	9	121	-13.8	-24.5	190.44	600.25	338.1
25	22	118	- .8	-27.5	.64	756.25	22.
26	25	150	2.2	4.5	4.84	20.25	9.9
27	14	134	- 8.8	-11.5	77.44	132.25	101.2
28	31	154	8.2	8.5	67.24	72.25	69.7
29	--	---	----	-----	-----	-----	-----
30	28	151	5.2	5.5	27.04	30.25	28.6
31	27	174	4.2	28.5	17.64	812.25	119.7
32	15	158	- 7.8	12.5	60.84	156.25	- 97.5
33	26	170	3.2	24.5	10.24	600.25	78.4
34	17	135	- 5.8	-10.5	33.64	110.25	60.9
35	17	136	- 5.8	- 9.5	33.64	90.25	55.1
36	27	93	4.2	-52.5	17.64	2756.25	-220.5
37	25	154	2.2	8.5	4.84	72.25	18.7
38	27	154	4.2	8.5	17.64	72.25	35.7
39	21	102	- 1.8	-43.5	3.24	1892.25	78.3
40	22	154	- .8	8.5	.64	72.25	- 6.8
41	16	146	- 6.8	.5	46.24	.25	- 3.4
42	26	172	3.2	26.5	10.24	702.25	84.8
43	14	131	- 8.8	-14.5	77.44	210.25	127.6
44	23	174	.2	28.5	.4	812.25	5.7
45	22	160	- .8	14.5	.64	210.25	- 11.6
46	30	164	7.2	18.5	51.84	342.25	133.2
47	21	132	- 1.8	-13.5	3.24	182.25	24.3

TABLE IV - Class of 1934

Correlation of Army Alpha and Algebra Placement Test Scores

No.	X	Y	X	Y	X	Y	XY
1	39	139	6.5	25.5	38.44	2988.25	331.7
2	33	146	3	5	4	25	1
3	30	110	-3.8	-35.5	7.44	1860.25	99.4
4	3	135	-13.8	-10.5	190.44	110.25	144.9
5	31	165	5.2	17.5	27.04	306.25	143.5
6	38	140	3.2	-5.5	10.24	30.25	-28.6
7	26	123	3.2	-8.5	10.24	72.25	-78
8	6	131	-16.8	-14.5	282.24	210.25	243.6
9	27	168	4.2	17.5	17.64	306.25	-73.5
10	30	145	-3.8	3.5	5.76	12.25	-9.8
11	35	153	3.2	37.5	4.84	1406.25	89.5
12	32	111	3.2	-34.5	4.84	1190.25	-72.9
13	32	148	3.2	8.5	4.84	72.25	2.5
14	27	180	4.2	34.5	17.64	1190.25	144.9
15	35	158	3.2	-7.5	10.24	25.25	-24
16	19	164	-3.8	18.5	14.44	342.25	-70.3
17	31	152	-1.8	7.5	3.24	26.25	-13.5
18	35	153	3.2	7.5	4.84	26.25	6
19	35	152	3.2	6.5	4.84	42.25	14.3
20	19	120	-3.8	-35.5	14.44	620.25	85.5
21	18	167	-4.8	21.5	23.04	462.25	-103.8
22	17	145	-5.8	5	33.64	25	2.9
23	38	178	3.2	36.5	27.04	708.25	137.8
24	2	131	-13.8	-34.5	190.44	600.25	338.1
25	32	118	3	-27.5	4.84	756.25	32
26	35	150	3.2	4.5	4.84	80.25	9.3
27	14	134	-8.8	-11.5	77.44	132.25	101.8
28	31	184	3.2	37.5	67.84	72.25	69.7
29	---	---	---	---	---	---	---
30	38	151	3.2	37.04	27.04	60.25	38.6
31	27	174	4.2	38.5	17.64	812.25	119.7
32	15	158	-7.8	12.5	60.84	156.25	-97.5
33	36	170	3.2	34.5	10.24	600.25	78.4
34	17	138	-5.8	-10.5	33.64	110.25	60.9
35	17	136	-5.8	-9.5	33.64	90.25	55.1
36	27	95	4.2	-32.5	17.64	2756.25	-230.5
37	35	154	3.2	38.5	4.84	72.25	18.7
38	27	154	4.2	38.5	17.64	72.25	32.7
39	31	103	-1.8	-43.5	3.24	1892.25	73.3
40	38	154	3	6.5	4.84	72.25	6.8
41	16	146	-8.8	5	46.24	25	-3.4
42	36	172	3.2	38.5	10.24	702.25	84.8
43	14	131	-8.8	-14.5	77.44	210.25	137.6
44	33	174	3	38.5	4	812.25	5.7
45	32	160	3	14.5	4	210.25	-11.6
46	30	164	7.2	18.5	21.84	342.25	153.2
47	31	155	-1.8	-13.5	3.24	182.25	24.3

TABLE IV e (1934)

No.	X	Y	x	y	x^2	y^2	xy
48	21	153	- 1.8	7.5	3.24	56.25	- 13.5
49	28	153	5.2	7.5	27.04	56.25	39.
50	24	165	1.2	19.5	1.44	380.25	23.4
51	30	170	7.2	24.5	51.84	600.25	176.4
52	17	134	- 5.8	-11.5	33.64	132.25	66.7
53	18	162	- 4.8	16.5	23.04	272.25	- 79.2
54	21	141	- 1.8	- 4.5	3.24	20.25	8.1
55	21	103	- 1.8	-42.5	3.24	1806.25	76.5
56	29	127	6.2	-18.5	38.44	342.25	- 114.7
57	27	161	4.2	15.5	17.64	240.25	65.1
58	25	156	2.2	10.5	4.84	110.25	23.1
59	22	130	- .8	-15.5	.64	240.25	12.4
60	27	155	4.2	9.5	17.64	90.25	39.9
61	12	68	-10.8	-77.5	116.64	6006.25	837.
62	27	135	4.2	-10.5	17.64	110.25	- 44.1
63	27	136	4.2	- 9.5	17.64	90.25	- 39.9
64	15	134	- 7.8	- 7.5	60.84	56.25	58.5
65	22	161	- .8	15.5	.64	240.25	- 12.4
66	19	115	- 3.8	-30.5	14.44	930.25	115.9
67	22	113	- .8	-32.5	.64	1056.25	26.
68	27	154	4.2	8.5	17.64	72.25	35.7
69	24	145	1.2	- .5	1.44	.25	- .6
70	26	159	3.2	13.5	10.24	182.25	43.2
71	22	166	- .8	20.5	.64	420.25	- 16.4
72	32	120	9.2	-25.5	84.64	650.25	- 234.6
73	23	118	.2	-27.5	.4	756.25	- 5.5
74	23	146	.2	.5	.4	.25	.1
75	31	181	8.2	35.5	67.24	1260.25	291.1
76	25	142	2.2	- 3.5	4.84	12.25	- 7.7
77	12	193	-10.8	47.5	116.64	2256.25	- 531.
78	16	143	- 6.8	- 2.5	46.24	6.25	17.
79	25	133	2.2	-12.5	4.84	156.25	- 27.5
80	27	175	4.2	29.5	17.64	870.25	123.9
81	12	143	-10.8	- 2.5	116.64	6.25	27.
82	27	140	4.2	- 5.5	17.64	30.25	- 23.1
83	31	143	8.2	- 2.5	67.24	6.25	- 20.5
84	17	160	- 5.8	14.5	33.64	210.25	- 84.1
85	14	141	- 8.8	- 4.5	77.44	20.25	39.6
86	27	167	4.2	21.5	17.64	462.25	90.3
87	23	178	.2	32.5	.4	1056.25	6.5
88	29	184	6.2	38.5	38.44	1482.25	238.7
89	24	173	1.2	27.5	1.44	756.25	33.
90	23	93	.2	-52.5	.4	2756.25	- 10.5
91	25	151	2.2	5.5	4.84	30.25	12.1
92	26	137	3.2	- 8.5	10.24	72.25	- 27.2
93	27	135	4.2	-10.5	17.64	110.25	- 44.1
94	25	142	2.2	- 3.5	4.84	12.25	- 7.7
95	24	138	1.2	- 7.5	1.44	56.25	- 9.
96	25	156	2.2	10.5	4.84	110.25	23.1

TABLE IV - (1934)

No.	X	Y	X	Y	X	Y	X	Y	
48	21	123	-	1.8	7.2	3.84	28.25	-	12.2
49	22	123	2.2	7.2	37.04	28.25	28.25	39.1	39.1
50	24	123	1.2	12.2	1.44	380.25	380.25	38.4	38.4
51	20	170	7.2	24.2	51.84	600.25	600.25	176.4	176.4
52	17	154	-	2.8	-11.2	33.64	132.25	66.7	66.7
53	18	162	-	4.8	16.2	23.04	272.25	72.2	72.2
54	21	141	-	1.8	-4.2	3.24	20.25	8.1	8.1
55	21	103	-	1.8	-42.2	3.24	1806.25	76.2	76.2
56	22	127	2.2	-12.2	39.44	342.25	342.25	114.7	114.7
57	27	121	4.2	12.2	17.64	240.25	240.25	62.1	62.1
58	22	122	2.2	10.2	4.84	110.25	110.25	23.1	23.1
59	22	120	-	2.8	-12.2	8.4	240.25	12.4	12.4
60	27	122	4.2	2.2	17.64	20.25	20.25	32.2	32.2
61	12	62	-10.2	-7.2	112.64	6006.25	6006.25	237.1	237.1
62	27	122	4.2	-10.2	17.64	110.25	110.25	44.1	44.1
63	27	122	4.2	-2.2	17.64	20.25	20.25	32.2	32.2
64	12	124	-	7.8	-7.2	60.84	22.25	22.2	22.2
65	22	121	-	2.8	12.2	8.4	240.25	12.4	12.4
66	12	112	-	2.8	-30.2	14.44	230.25	112.2	112.2
67	22	112	-	2.8	-32.2	8.4	1022.25	22.2	22.2
68	27	124	4.2	2.2	17.64	72.25	72.25	22.7	22.7
69	24	142	1.2	-	1.44	1.25	1.25	2.2	2.2
70	22	122	2.2	12.2	10.24	122.25	122.25	42.2	42.2
71	22	122	-	2.8	20.2	42.25	420.25	12.4	12.4
72	22	120	2.2	-22.2	84.64	220.25	220.25	224.2	224.2
73	22	112	-	2.8	-27.2	4	722.25	2.2	2.2
74	22	142	2.2	-	4	1.25	1.25	1.1	1.1
75	21	121	2.2	22.2	67.84	1220.25	1220.25	221.1	221.1
76	22	142	2.2	-2.2	4.84	12.25	12.25	7.7	7.7
77	12	122	-10.2	47.2	112.64	2222.25	2222.25	221.1	221.1
78	12	142	-	2.8	-2.2	42.84	2.25	17.1	17.1
79	22	122	2.2	-12.2	4.84	122.25	122.25	27.2	27.2
80	27	172	4.2	22.2	17.64	270.25	270.25	122.2	122.2
81	12	142	-10.2	-2.2	112.64	2.25	2.25	27.1	27.1
82	27	140	4.2	-2.2	17.64	20.25	20.25	22.1	22.1
83	21	142	2.2	-2.2	67.84	2.25	2.25	20.2	20.2
84	17	120	-	2.8	14.2	23.64	210.25	24.1	24.1
85	14	141	-	2.8	-4.2	17.64	20.25	22.2	22.2
86	27	127	4.2	21.2	17.64	422.25	422.25	20.2	20.2
87	22	172	2.2	22.2	4	1022.25	1022.25	2.2	2.2
88	22	124	2.2	22.2	22.44	1422.25	1422.25	222.7	222.7
89	24	172	1.2	27.2	1.44	722.25	722.25	22.1	22.1
90	22	22	-	2.2	4	2722.25	2722.25	10.2	10.2
91	22	121	2.2	2.2	4.84	30.25	30.25	12.1	12.1
92	22	127	2.2	-2.2	10.24	72.25	72.25	27.2	27.2
93	27	122	4.2	-10.2	17.64	110.25	110.25	44.1	44.1
94	22	142	2.2	-2.2	4.84	12.25	12.25	7.7	7.7
95	24	122	1.2	-7.2	1.44	22.25	22.25	2.2	2.2
96	22	122	2.2	10.2	4.84	110.25	110.25	22.1	22.1

91.
TABLE IV e (1934)

No.	X	Y	x	y	x ²	y ²	xy
97	25	151	2.2	5.5	4.84	30.25	12.1
98	28	144	5.2	- 1.5	27.04	2.25	- 7.8
99	24	167	1.2	21.5	1.44	462.25	25.8
100	30	157	7.2	11.5	51.84	132.25	82.8
101	8	152	-14.8	6.5	219.04	42.25	- 96.2
102	32	102	9.2	-43.5	84.64	1892.25	- 400.2
103	23	158	.2	12.5	.4	156.25	2.5
104	14	103	- 8.8	-42.5	77.44	1806.25	374.
105	--	---	----	----	-----	-----	-----
106	14	161	- 8.8	15.5	77.44	240.25	- 136.4
107	27	137	4.2	- 8.5	17.64	72.25	- 35.7
108	18	139	- 4.8	- 6.5	23.04	42.25	31.2
109	28	177	5.2	31.5	27.04	992.25	163.8
110	27	169	4.2	23.5	17.64	552.25	98.7
111	15	157	- 7.8	11.5	60.84	132.25	- 89.7
112	25	99	2.2	-46.5	4.84	2162.25	- 102.3
113	22	130	- .8	-15.5	.64	240.25	12.4
114	27	158	4.2	12.5	17.64	156.25	52.5
115	28	169	5.2	23.5	27.04	552.25	122.2
116	28	128	5.2	-17.5	27.04	306.25	- 91.
117	24	124	1.2	-21.5	1.44	462.25	- 25.8
118	31	141	8.2	- 4.5	67.24	20.25	- 36.9
119	26	146	3.2	.5	10.24	.25	1.6
120	10	132	-12.8	-13.5	163.84	182.25	172.8
121	20	112	- 2.8	-33.5	7.84	1122.25	93.8
122	21	150	- 1.8	4.5	3.24	20.25	- 8.1
123	22	160	- .8	14.5	.64	210.25	- 11.6
124	18	137	- 4.8	- 7.5	23.04	56.25	36.
125	16	158	- 6.8	12.5	46.24	156.25	- 85.
126	27	152	4.2	6.5	17.64	42.25	27.3
124	2,825	18,045			3,919.24	61,353.64	3,408.7
	22.8	145.5					

$$r, \text{ the coeff. of correlation, } = \frac{\sum xy}{\sqrt{\sum x^2} \times \sqrt{\sum y^2}} = \frac{3,408.7}{\sqrt{3,919.2} \times \sqrt{61,353.6}}$$

$$r = \frac{3,408.7}{62.6 \times 247.7} = \frac{3,408.7}{15,506.02} = 0.2198$$

$$P.E._r = \frac{.6745 \times (1-r^2)}{\sqrt{N}} = \frac{.6745 \times (1-.048)}{\sqrt{124}} = \frac{.6745 \times .952}{11.14}$$

$$P.E._r = .058$$

TABLE IV e (1954)

No.	X	Y	x	y	X	Y	x	y
97	25	151	2.5	2.5	131	20.25	4.84	20.25
98	28	144	2.8	-1.2	144	2.25	27.04	2.25
99	24	137	1.2	21.2	137	483.25	1.44	483.25
100	30	127	7.5	11.2	127	51.84	51.84	138.25
101	8	123	-14.8	6.2	123	48.04	219.04	48.25
102	32	102	2.2	-42.2	102	84.64	84.64	1892.25
103	23	128	2	12.2	128	4	4	156.25
104	14	103	-8.8	-42.2	103	77.44	1808.25	374
105	--	--	--	--	--	--	--	--
106	14	161	-8.8	12.2	161	240.25	77.44	240.25
107	27	137	4.2	-8.2	137	72.25	17.64	72.25
108	18	132	-4.8	-6.2	132	48.25	23.04	48.25
109	28	177	2.2	21.2	177	87.04	87.04	948.25
110	27	162	4.2	23.2	162	528.25	17.64	528.25
111	15	127	-7.8	11.2	127	80.84	60.84	152.25
112	22	99	2.2	-46.2	99	4.84	2168.25	4.84
113	22	130	2	-12.2	130	64	64	240.25
114	27	128	4.2	12.2	128	156.25	17.64	156.25
115	28	162	2.2	23.2	162	87.04	87.04	528.25
116	28	128	2.2	-17.2	128	304.25	87.04	304.25
117	24	184	1.2	-21.2	184	468.25	1.44	468.25
118	21	141	-2.8	-4.2	141	87.84	67.84	80.25
119	26	146	2.2	2	146	10.24	10.24	88
120	10	122	-12.8	-12.2	122	163.84	163.84	182.25
121	20	116	-2.8	-32.2	116	7.84	1128.25	7.84
122	21	120	-1.8	-4.2	120	20.25	3.24	20.25
123	22	120	2	14.2	120	810.25	64	810.25
124	18	127	-4.8	-7.2	127	52.04	52.04	52.25
125	16	158	-6.8	12.2	158	46.24	46.24	156.25
126	27	122	4.2	6.2	122	17.64	17.64	42.25
127	28	120	2.2	-32.2	120	810.25	42.25	810.25
128	28	120	2.2	-32.2	120	810.25	42.25	810.25
129	28	120	2.2	-32.2	120	810.25	42.25	810.25
130	28	120	2.2	-32.2	120	810.25	42.25	810.25
131	28	120	2.2	-32.2	120	810.25	42.25	810.25
132	28	120	2.2	-32.2	120	810.25	42.25	810.25
133	28	120	2.2	-32.2	120	810.25	42.25	810.25
134	28	120	2.2	-32.2	120	810.25	42.25	810.25
135	28	120	2.2	-32.2	120	810.25	42.25	810.25
136	28	120	2.2	-32.2	120	810.25	42.25	810.25
137	28	120	2.2	-32.2	120	810.25	42.25	810.25
138	28	120	2.2	-32.2	120	810.25	42.25	810.25
139	28	120	2.2	-32.2	120	810.25	42.25	810.25
140	28	120	2.2	-32.2	120	810.25	42.25	810.25
141	28	120	2.2	-32.2	120	810.25	42.25	810.25
142	28	120	2.2	-32.2	120	810.25	42.25	810.25
143	28	120	2.2	-32.2	120	810.25	42.25	810.25
144	28	120	2.2	-32.2	120	810.25	42.25	810.25
145	28	120	2.2	-32.2	120	810.25	42.25	810.25
146	28	120	2.2	-32.2	120	810.25	42.25	810.25
147	28	120	2.2	-32.2	120	810.25	42.25	810.25
148	28	120	2.2	-32.2	120	810.25	42.25	810.25
149	28	120	2.2	-32.2	120	810.25	42.25	810.25
150	28	120	2.2	-32.2	120	810.25	42.25	810.25
151	28	120	2.2	-32.2	120	810.25	42.25	810.25
152	28	120	2.2	-32.2	120	810.25	42.25	810.25
153	28	120	2.2	-32.2	120	810.25	42.25	810.25
154	28	120	2.2	-32.2	120	810.25	42.25	810.25
155	28	120	2.2	-32.2	120	810.25	42.25	810.25
156	28	120	2.2	-32.2	120	810.25	42.25	810.25
157	28	120	2.2	-32.2	120	810.25	42.25	810.25
158	28	120	2.2	-32.2	120	810.25	42.25	810.25
159	28	120	2.2	-32.2	120	810.25	42.25	810.25
160	28	120	2.2	-32.2	120	810.25	42.25	810.25
161	28	120	2.2	-32.2	120	810.25	42.25	810.25
162	28	120	2.2	-32.2	120	810.25	42.25	810.25
163	28	120	2.2	-32.2	120	810.25	42.25	810.25
164	28	120	2.2	-32.2	120	810.25	42.25	810.25
165	28	120	2.2	-32.2	120	810.25	42.25	810.25
166	28	120	2.2	-32.2	120	810.25	42.25	810.25
167	28	120	2.2	-32.2	120	810.25	42.25	810.25
168	28	120	2.2	-32.2	120	810.25	42.25	810.25
169	28	120	2.2	-32.2	120	810.25	42.25	810.25
170	28	120	2.2	-32.2	120	810.25	42.25	810.25
171	28	120	2.2	-32.2	120	810.25	42.25	810.25
172	28	120	2.2	-32.2	120	810.25	42.25	810.25
173	28	120	2.2	-32.2	120	810.25	42.25	810.25
174	28	120	2.2	-32.2	120	810.25	42.25	810.25
175	28	120	2.2	-32.2	120	810.25	42.25	810.25
176	28	120	2.2	-32.2	120	810.25	42.25	810.25
177	28	120	2.2	-32.2	120	810.25	42.25	810.25
178	28	120	2.2	-32.2	120	810.25	42.25	810.25
179	28	120	2.2	-32.2	120	810.25	42.25	810.25
180	28	120	2.2	-32.2	120	810.25	42.25	810.25
181	28	120	2.2	-32.2	120	810.25	42.25	810.25
182	28	120	2.2	-32.2	120	810.25	42.25	810.25
183	28	120	2.2	-32.2	120	810.25	42.25	810.25
184	28	120	2.2	-32.2	120	810.25	42.25	810.25
185	28	120	2.2	-32.2	120	810.25	42.25	810.25
186	28	120	2.2	-32.2	120	810.25	42.25	810.25
187	28	120	2.2	-32.2	120	810.25	42.25	810.25
188	28	120	2.2	-32.2	120	810.25	42.25	810.25
189	28	120	2.2	-32.2	120	810.25	42.25	810.25
190	28	120	2.2	-32.2	120	810.25	42.25	810.25
191	28	120	2.2	-32.2	120	810.25	42.25	810.25
192	28	120	2.2	-32.2	120	810.25	42.25	810.25
193	28	120	2.2	-32.2	120	810.25	42.25	810.25
194	28	120	2.2	-32.2	120	810.25	42.25	810.25
195	28	120	2.2	-32.2	120	810.25	42.25	810.25
196	28	120	2.2	-32.2	120	810.25	42.25	810.25
197	28	120	2.2	-32.2	120	810.25	42.25	810.25
198	28	120	2.2	-32.2	120	810.25	42.25	810.25
199	28	120	2.2	-32.2	120	810.25	42.25	810.25
200	28	120	2.2	-32.2	120	810.25	42.25	810.25

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}} = \frac{3,408.7}{\sqrt{15,206.05 \times 2,847.7}} = 0.8198$$

$$F.E.L = \frac{1}{\sqrt{n}} \sqrt{1 - r^2} = \frac{1}{\sqrt{200}} \sqrt{1 - 0.6745} = 0.058$$

Conclusions.

Class	1938	1937	1936	1935	1934
Test used	Well's Revision	Well's Revision	Original Alpha	Original Alpha	Original Alpha
Coefficient of Correlation	.22	.58	.428	.242	.2198
Cases Studied	238	340	276	194	124

The values of r as found in this calculation present a somewhat confusing picture. Three out of the five classes give very nearly the same coefficient but one of them (1938) was made with the Well's revision of Army Alpha while the others used the original form of Army Alpha. Of the two divergent values one, (1937), was made on the new form with the University of Iowa algebra placement test while the other was made under the same conditions as two consistent results.

In spite of this discrepancy a definite answer has been obtained to the question under consideration, namely, whether the Army Alpha results could be used for forming algebra sections as well as the algebra placement tests. From the relatively low correlation it is apparent that while the Alpha test gives a good indication of general intelligence level, the algebra test is essential for algebra sectioning.

Probably some of the discrepancy noted is due to the fact that the Alpha test indicates the general level of a person's intelligence while the algebra test indicates a level of ability which depends upon many other factors besides intelligence; infact this ability may have a negative correlation with intelligence in a considerable number of cases.

Conclusions.

Class	1938	1937	1936	1935	1934
Test used	Well's Revision	Well's Revision	Original Alpha	Original Alpha	Original Alpha
Coefficient of Correlation	.82	.58	.428	.242	.2128
Cases Studied	238	240	276	194	124

The values of r as found in this calculation present a somewhat contrasting picture. Three out of the five classes give very nearly the same coefficient but one of them (1938) was made with the Well's revision of Army Alpha while the others used the original form of Army Alpha. Of the two divergent values one, (1937), was made on the new form with the University of Iowa algebra placement test while the other was made under the same conditions as two consistent results.

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Since the values of Army Alpha test scores are readily available it has been decided to plot their values as a normal probability curve. This curve will have the scores as abscissae and the frequency of occurrence of each score as ordinates. The purpose of this undertaking is to test the validity of the assertion made by some educators that the distribution of grades in any course and subject matter will fall very closely along the true curve of probability. It is further asserted that grades in a class can most equitably be awarded by scoring the tests in some arbitrary manner which will give a relative standing in the class, arranging the scores on the normal curve, and assigning A to those whose marks fall on a certain part of the curve, B to those whose marks fall on another part of the curve, etc.¹ The recommended percentage of the entire group which should receive a certain grade varies with different authors but Prof. Eells has recently advocated the following proportions; A - 6% of group, B - 22%, C - 44%, D - 22%, F - 6%, which are representative values.² Obviously if this theory is tenable, the points plotted should lie smoothly along the normal curve and the curves in the same subject should not show great variations from year to year. The curves shown in text books and papers concerning this subject are invariably smooth and regular and it is desirable to know if this is justified by the data or if only the points giving good

1. School Science and Mathematics, Vol. XIV, Page 283
"A new Marking System and means of measuring Mathematical Abilities." by F. Cajori.
2. Journal of Ed. Psy. Vol. XXI. Page 128.

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results have been plotted, a most reprehensible condition but one which is all too frequently found to exist. Authors in this field are also somewhat vague as to the smallest size of class to which this method applies, and further data on this point would be desirable.

The Army Alpha test is believed to be particularly suitable for this purpose due to its wide range and large number of questions. With a considerable list of questions in each of its eight parts a sufficient range should be available to prevent appreciable sampling in the group.

In pages 95 to 100 are included the actual frequency curves for the five classes. From an inspection of the curves it is obvious that in all cases there is much deviation from the normal curve. In the curves for the classes of '38 and '37, particularly the latter, there is a "normal" trend to the points but in the curves for the other three classes this is almost entirely lacking. These two curves represent 238 and 340 cases respectively and show a slight trend, but the class of '36 with 276 cases shows very little trend toward a definite curve although the points are massed together in a bell shaped area.

On page 100 is plotted the entire group of five classes representing 1275 men. As might be expected with this large group there is a definite trend toward the bell shape, although many points still lie a considerable distance from the curve. From the data available it would be

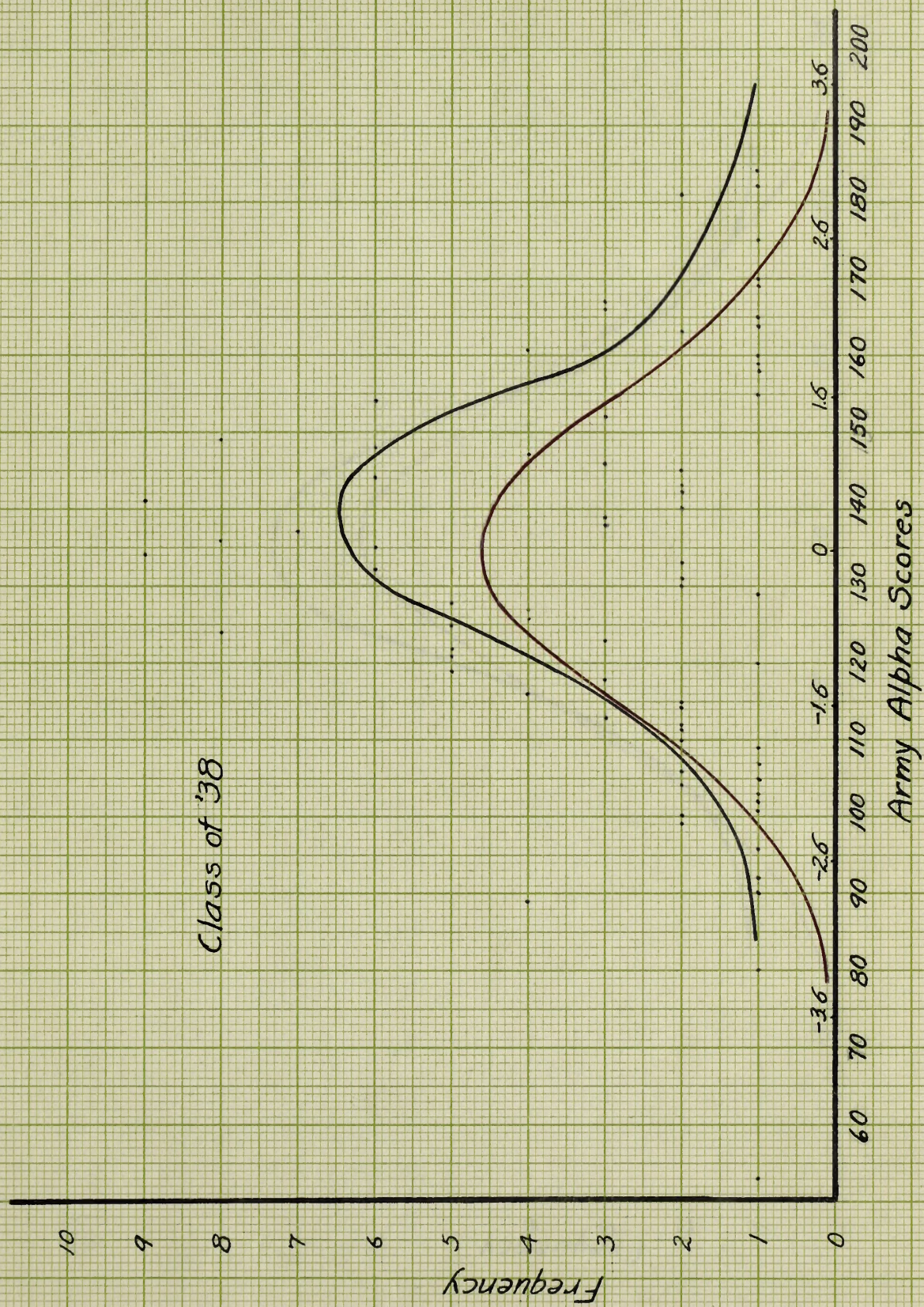
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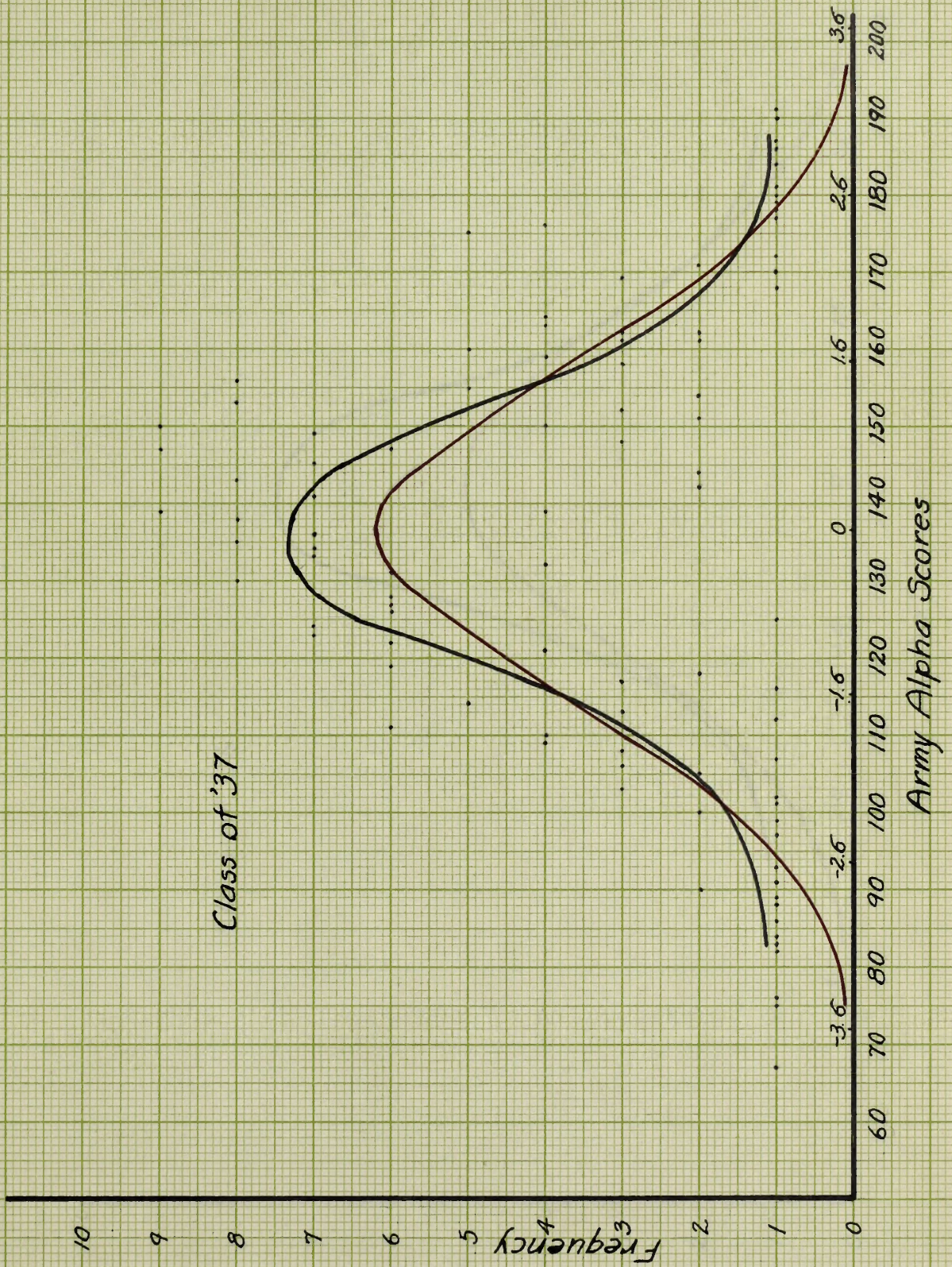
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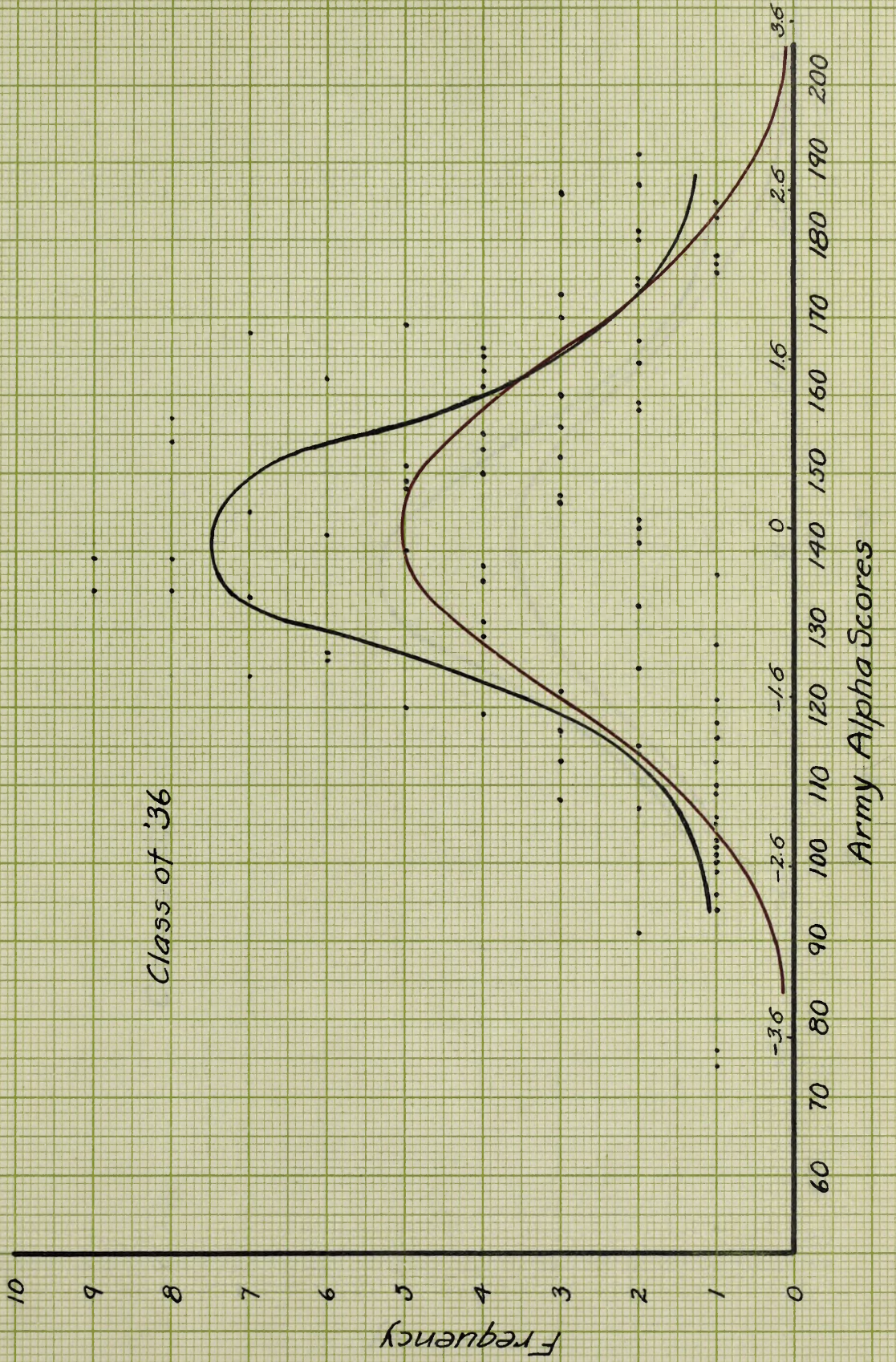
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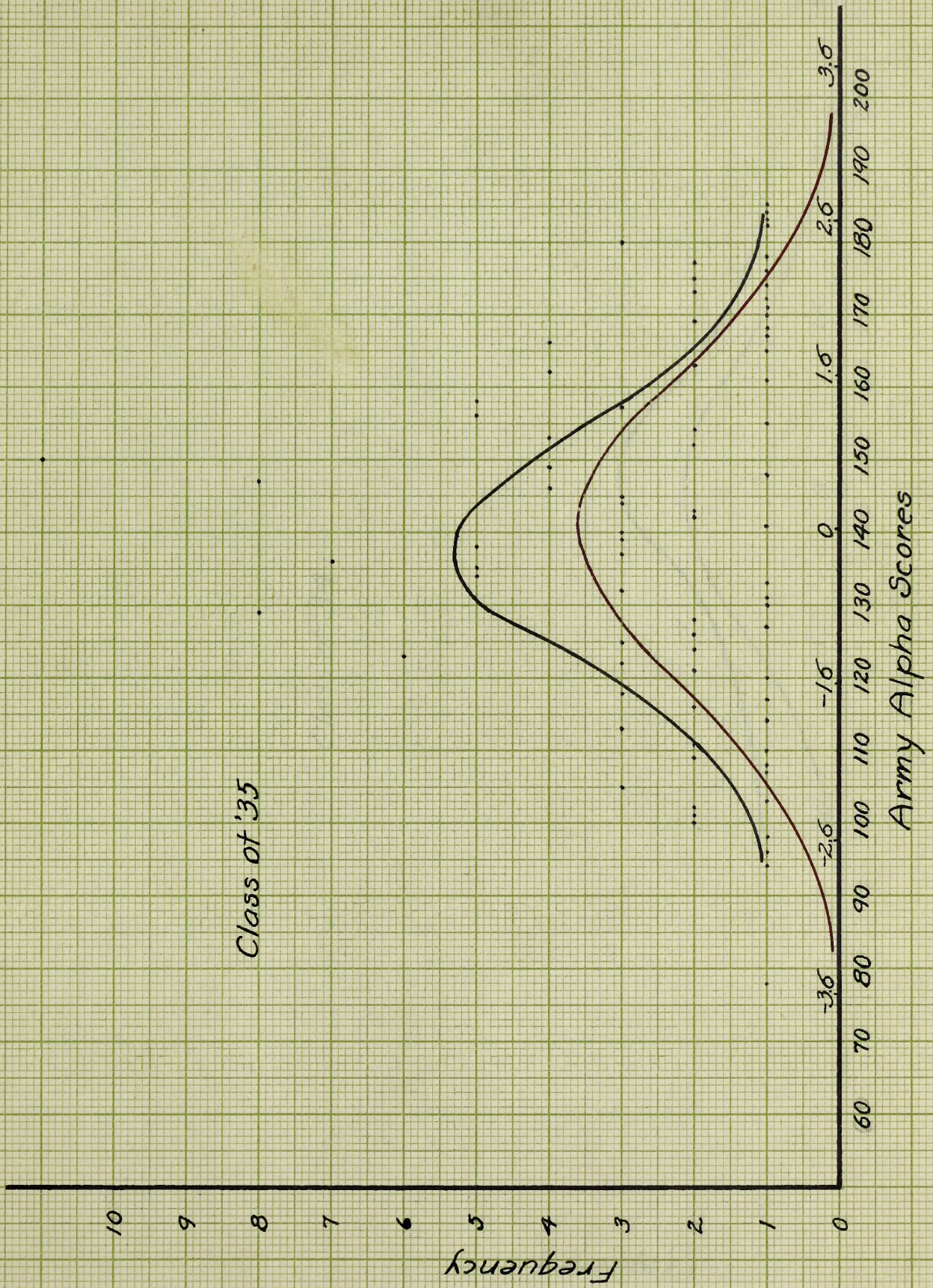




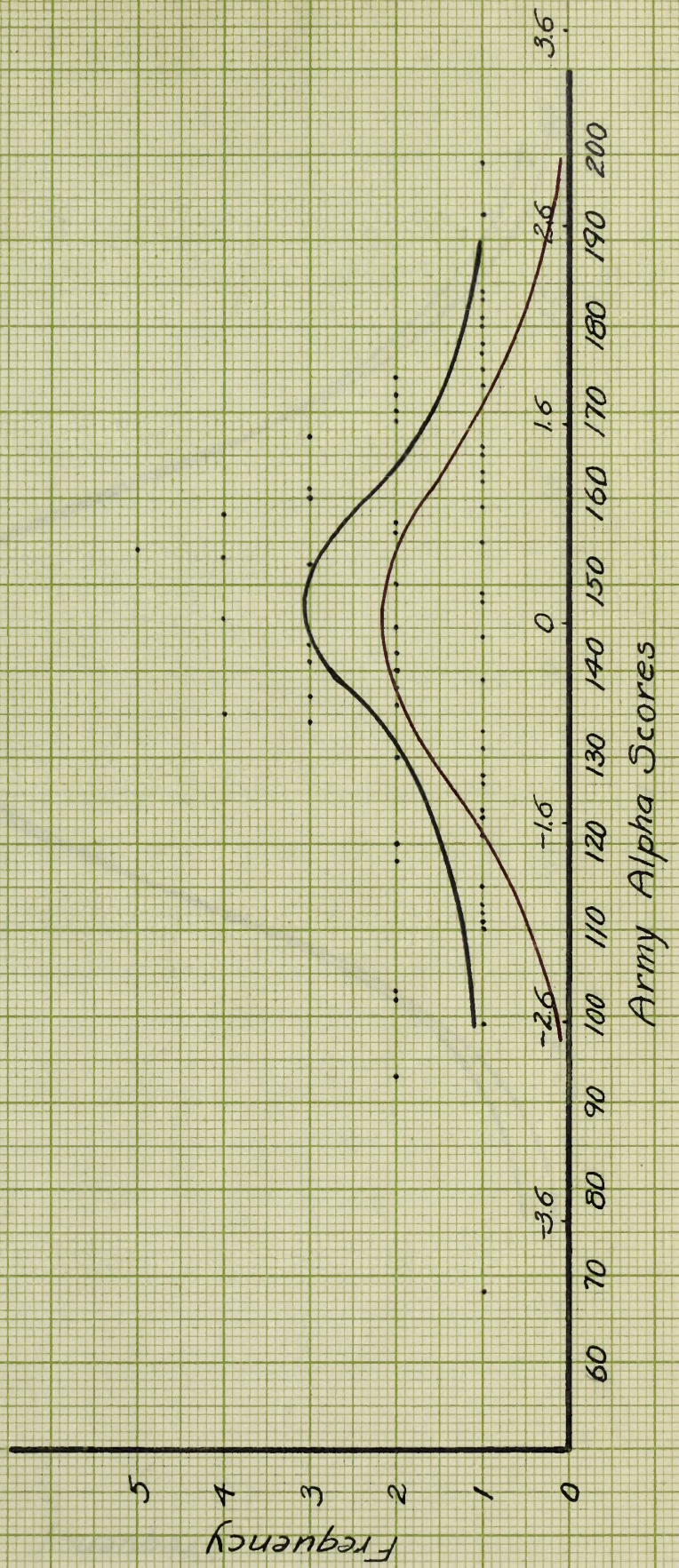
1936

Class of '36





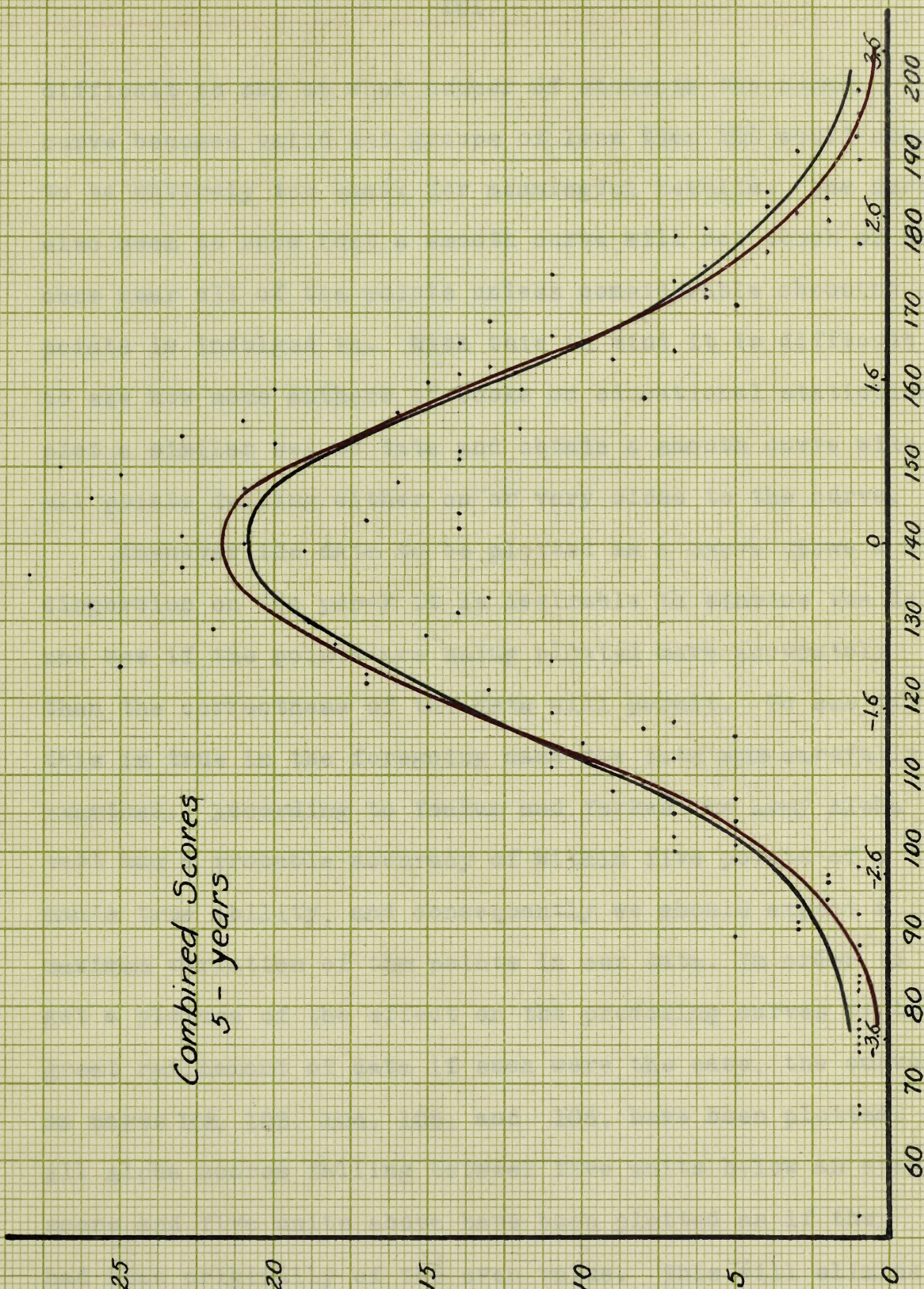
Class of '34



Combined Scores
5 - years

Frequency

Army Alpha Scores

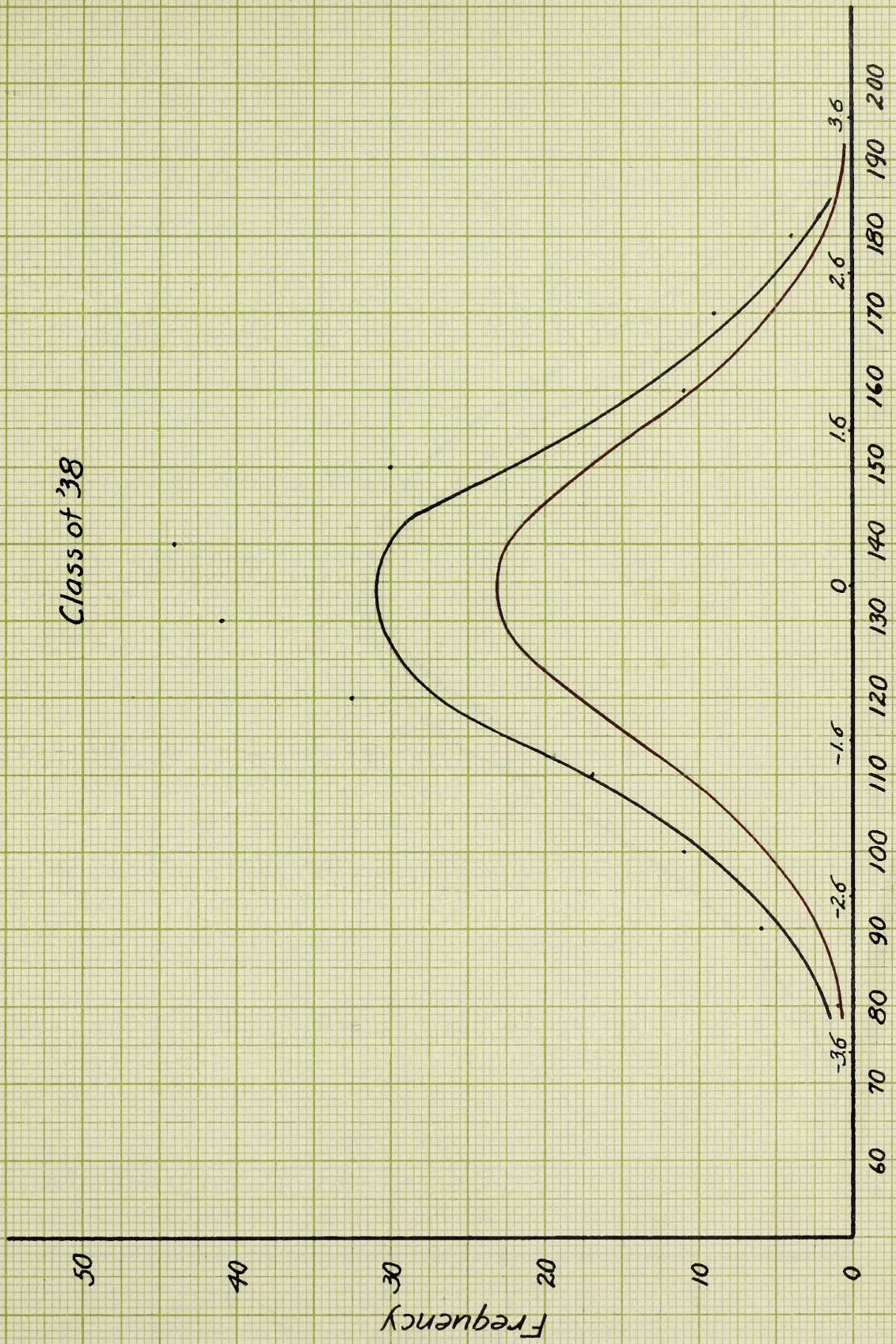


difficult to say at what number of students the normal curve becomes valid but groups of less than 200 would seem to be entirely too small for meaningful results. The curves also seem to show that a smooth curve will not touch or even come near all of the points unless considerable choosing of points is indulged in. With this in mind it is difficult to see how some authors of books on educational statistics plot a similar set of data and obtain a smooth curve with all points falling either on or very close to the curve.

Whenever the data to be plotted as a curve shows a wide dispersion on the paper it is desirable to examine the data and see if the points are being plotted more accurately than the correctness of the data will permit. To see if this is true in the foregoing case the data were carefully examined. According to Yoakum and Yerkes the Army Alpha test has a probable accuracy of within five points of a man's true ability, and consequently we should expect a maximum variation of ~~ten~~ points in our data. In order to get a picture of the effect on the preceding curves of too great refinement of data if such were the case, the curves on pages 102, 103, 104, 105, and 106, have been plotted. All Alpha scores falling between five units below an even score and five units above have been plotted as if they had been originally of the even value. This will eliminate many divergent points and if deviation from the normal curve were caused solely by too great an apparent accuracy

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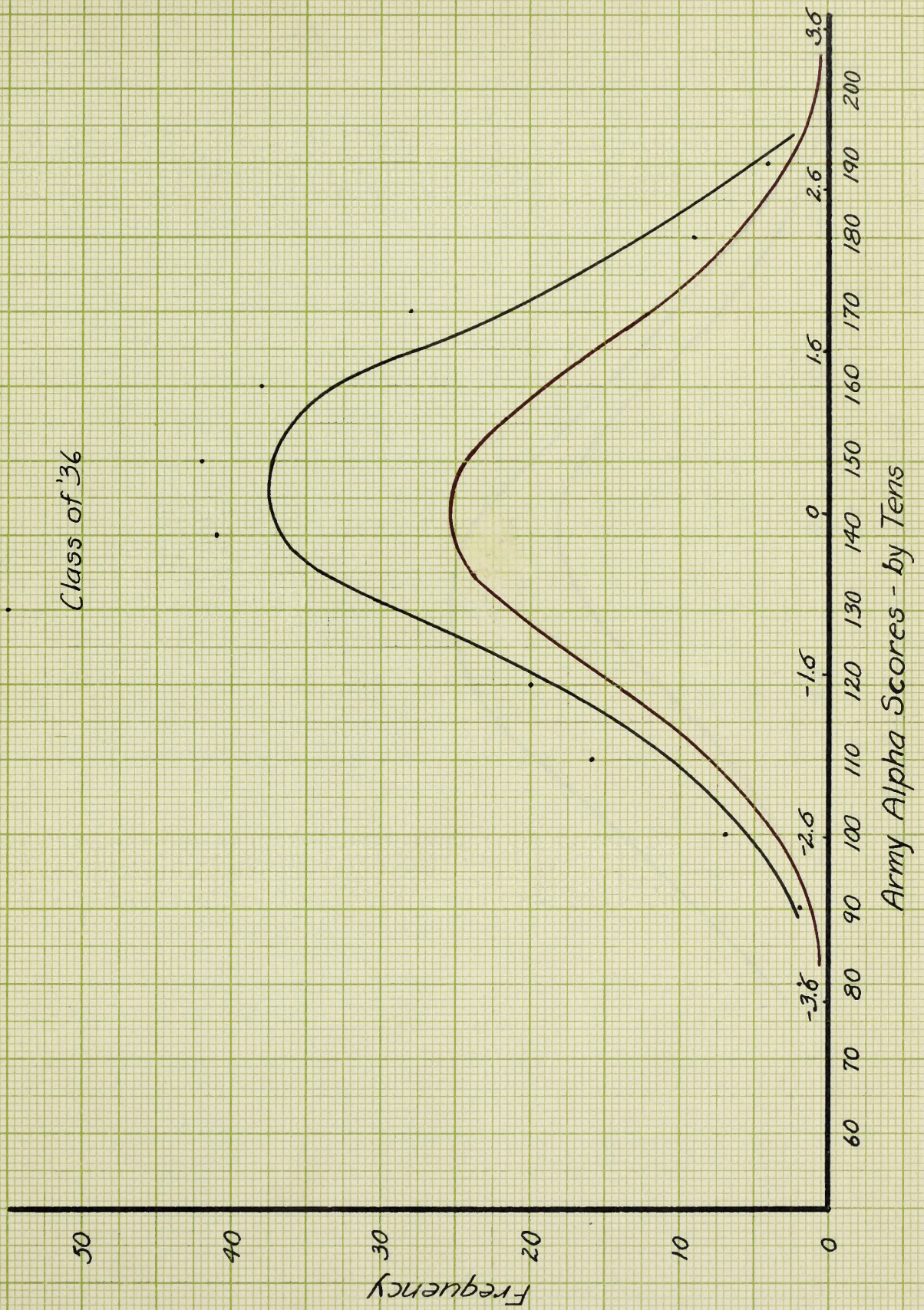
Class of '38



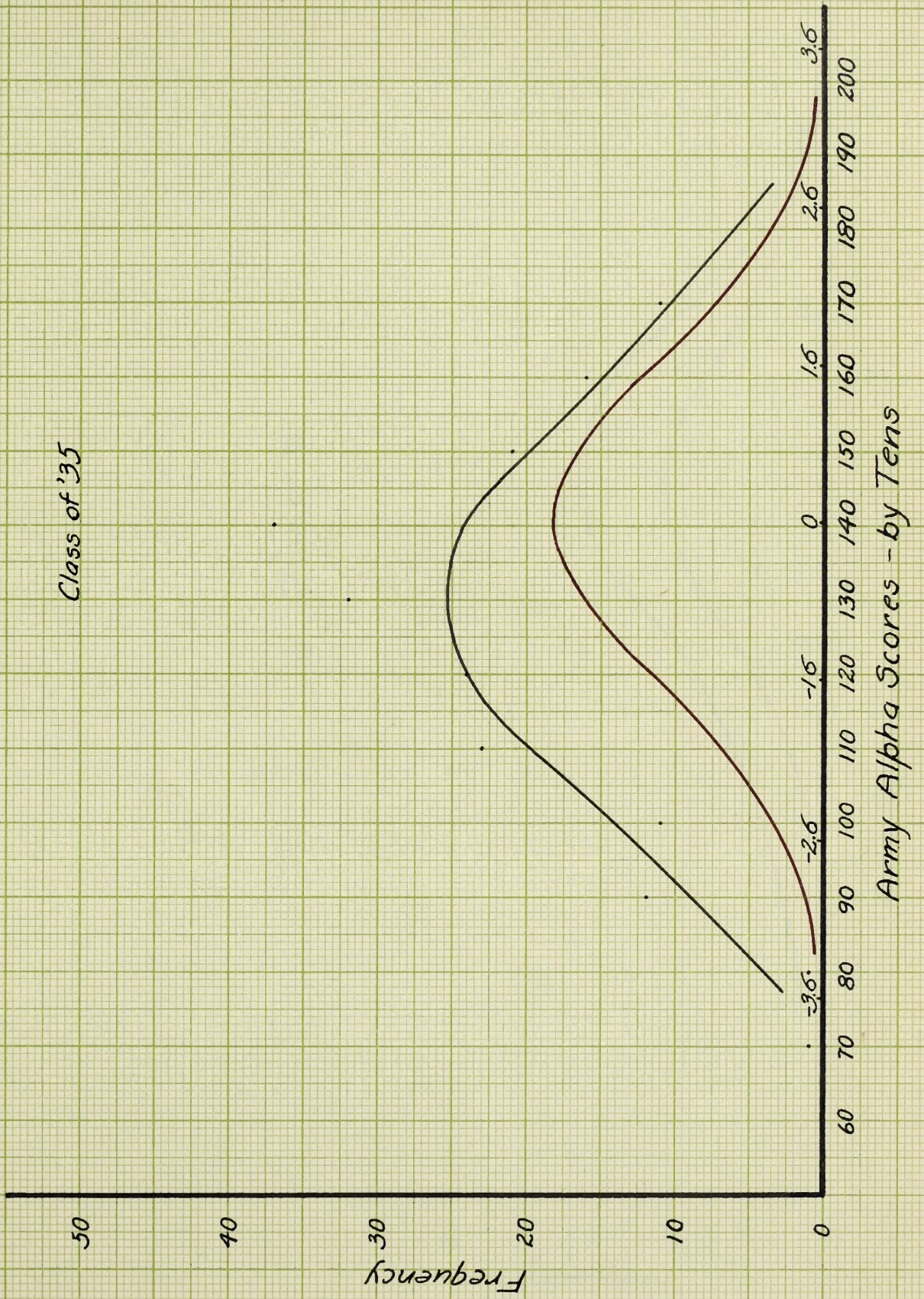
Class of '37



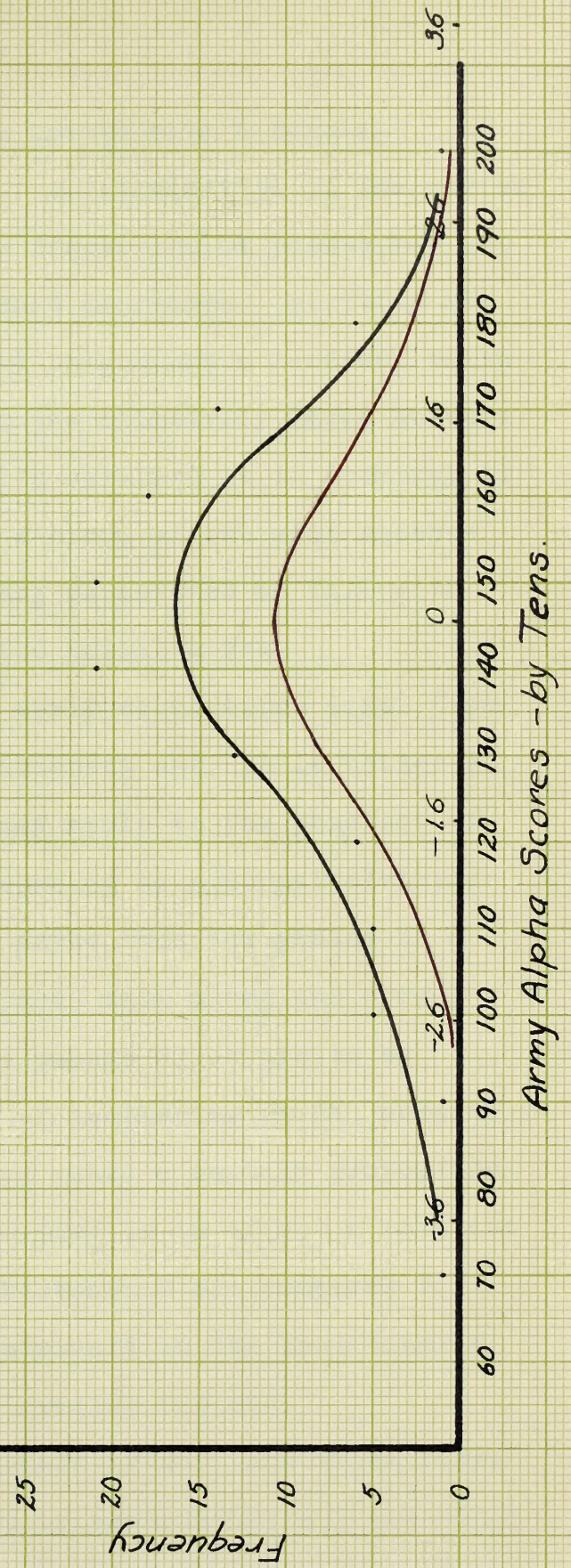
Army Alpha Scores - by Tens.



Class of '35



Class of '34



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While it is dangerous to apply conclusions drawn from one situation to a somewhat different one, it is believed that information gained here may apply to the practice of awarding grades in a class according to a "normal" distribution. Exponents of this plan argue that the grades in a class will, if accurately awarded, fall along the normal curve. They, therefore, score papers which are to be graded, arrange them in order of decreasing merit, compare them with the normal curve, and award a certain proportion of A's, B's, C's, etc. (1) This method is in effect a relative method where the student's achievements are compared to each other's instead of to a standard in the instructor's mind as in so-called absolute grading methods.

Although this may be a simple method, one which lends itself well to correction work by assistants, and one which is more accurate than the "absolute" system of some instruc-

(1) Statistics in Psychology and Education - Garrett. pg.101

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Far worse than the possible inaccuracy of the normal curve is the tendency for scholastic standards in a course to be relaxed when it is used and for students to be graded

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not on a basis of what quality of work they achieve but on a basis of how many men in the group know less about the subject than they do. There is also the possibility, which should not happen under best conditions, of a large group of mediocre students in a class doing rather poor work but due to the practice of awarding a certain percentage of A's, B's, etc., obtaining good grades for an inferior quality of work. On the other hand, it is quite possible where there is a large group of superior students in a class for the instructor to be obliged to award ordinary grades for better than ordinary work if the normal distribution of grades is rigidly adhered to.

If some artificial factor is used to correct this condition it must be formulated subjectively by the instructor and is therefore subject to all of the objections advanced against the subjective form of test and grade assignment.

In the foregoing discussion it has been the object of the author, not to show that the normal curve has no legitimate use as a part of the grading technique, but to indicate that its great advantages as pointed out by some authors are more apparent than real in certain cases, particularly in groups of less than 200 men; to indicate that it will always be somewhat inaccurate; and to submit the thought that its use tends to lose sight of scholastic achievement and to emphasize relative standing in the group.

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If used in determining grades it should not be the only method but should serve to supplement and check upon the instructor's judgment in awarding grades based on actual achievement.

Regardless of the requirements of the particular situation, there is no mechanism or technique which will replace or render unnecessary a fair, open minded, judicial attitude on the part of the instructor coupled with a love for learning and a deep interest in the profession and in the greatest possible progress for each student.

Lacking these pre-requisites there is no "mechanical" system of grading in existence which will produce good results and if they are present there will be little difficulty experienced.

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Chapter IV.RELATION OF ARMY ALPHA ARITHMETIC SECTION SCORES TO
ALGEBRA FINAL GRADES.

The designers of the Army Alpha test in attempting to get a sufficiently wide range of questions so that the test would be free from selection included questions that tested understanding, retention, and a wide range of general information as well as mathematical ability. The section of questions on arithmetic is difficult enough so that few persons tested get a perfect score in the time allowed for completion.

Although the total Army Alpha score apparently is not closely related to the score achieved by the same person on the algebra placement test, it seems entirely possible that there may be a somewhat closer relation between the Alpha arithmetic section score and the algebra final grade.

It will be the purpose of the following computations to determine the relation, or lack of one, existing between the scores achieved on the arithmetic section of the Army Alpha test and the grades which the same persons made in college algebra. If there is found to be a fairly close relation between the two sets of results, a very convenient means of algebra sectioning would be available without the additional bother of giving an algebra placement test.

Chapter IV.

RELATION OF ARMY ALPHA ARITHMETIC SECTION SCORES TO
ALGEBRA FINAL GRADES.

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Although the total Army Alpha score apparently is not closely related to the score achieved by the same person on the algebra placement test, it seems entirely possible that there may be a somewhat closer relation between the Alpha arithmetic section score and the algebra final grade.

It will be the purpose of the following computations to determine the relation, or lack of one, existing between the scores achieved on the arithmetic section of the Army Alpha test and the grades which the same persons made in college algebra. If there is found to be a fairly close relation between the two sets of results, a very convenient means of algebra sectioning would be available without the additional bother of giving an algebra placement test.

In case the correlation of the arithmetic section with the final grades is less close than the relation between the total Alpha score and the algebra placement score it is possible that a pseudo correlation exists between the Alpha scores and the placement test scores.

In case the correlation of the arithmetic section with the final grades is less close than the relation between the total Alpha score and the algebra placement score it is possible that a pseudo correlation exists between the Alpha scores and the placement test scores.

TABLE V a (1938)

Correlation Between the Arithmetic Section of the
Army Alpha and Algebra Final Grades

No.	X	Y	x	y	x ²	y ²	xy
1	--	---	--	--	--	--	---
2	9	75	- 1.8	0.7	3.24	.49	- 1.26
3	8	65	- 2.8	- 9.3	7.84	86.49	26.04
4	8	50	- 2.8	-24.3	7.84	590.49	68.04
5	11	85	0.2	10.7	.04	114.49	2.14
6	12	75	1.2	0.7	1.44	.49	.84
7	11	65	0.2	- 9.3	.04	86.49	- 1.86
8	11	85	0.2	10.7	.04	114.49	2.14
9	10	85	- 0.8	10.7	.64	114.49	- 8.56
10	6	40	- 4.8	-34.3	23.04	1176.49	164.64
11	13	65	2.2	- 9.3	4.84	86.49	- 20.46
12	9	50	- 1.8	-24.3	3.24	590.49	43.74
13	8	65	- 2.8	- 9.3	7.84	86.49	26.04
14	--	--	---	---	---	---	---
15	10	50	- 0.8	-24.3	.64	590.49	19.44
16	11	85	0.2	10.7	.04	114.49	2.14
17	14	85	3.2	10.7	10.24	114.49	34.24
18	14	75	3.2	0.7	10.24	.49	2.24
19	11	75	0.2	0.7	.04	.49	.14
20	11	85	0.2	10.7	.04	114.49	2.14
21	8	85	- 2.8	10.7	7.84	114.49	- 29.96
22	14	95	3.2	20.7	10.24	428.49	66.24
23	8	50	- 2.8	-24.3	7.84	590.49	68.04
24	13	95	2.2	20.7	4.84	428.49	45.54
25	11	75	0.2	0.7	.04	.49	.14
26	9	85	- 1.8	10.7	3.24	114.49	- 19.26
27	10	85	- 0.8	10.7	.64	114.49	- 8.56
28	13	75	2.2	0.7	4.84	.49	1.54
29	13	85	2.2	10.7	4.84	114.49	23.54
30	12	50	1.2	-24.3	1.44	590.49	- 29.16
31	10	75	- 0.8	0.7	.64	.49	- .56
32	9	65	- 1.8	- 9.3	3.24	86.49	17.84
33	12	75	1.2	0.7	1.44	.49	.84
34	10	85	- 0.8	10.7	.64	114.49	- 8.56
35	9	65	-1.8	- 9.3	3.24	86.49	17.84
36	12	65	1.2	- 9.3	1.44	86.49	- 11.16
37	11	75	0.2	0.7	.04	.49	.14
38	13	95	2.2	20.7	4.48	428.49	45.54
39	12	95	1.2	20.7	1.44	428.49	24.84
40	13	95	2.2	20.7	4.84	428.49	45.54
41	8	75	- 2.8	0.7	7.84	.49	- 1.96
42	11	75	0.2	0.7	.04	.49	.14
43	12	85	1.2	10.7	1.44	114.49	12.84
44	11	75	0.2	0.7	.04	.49	.14
45	11	65	0.2	- 9.3	.04	86.49	- 1.86

TABLE V B (1938)

Correlation between the Arithmetic Section of the
Army Alpha and Algebra Final Grades

No.	X	Y	x	y	X	Y	xy
1	--	---	--	--	--	---	---
2	9	78	-1.8	-0.7	8.28	7.44	-1.38
3	8	88	-2.8	-2.3	7.84	5.29	32.04
4	8	80	-2.8	-3.3	7.84	10.89	38.04
5	11	88	0.2	10.7	0.04	114.49	2.14
6	12	75	1.2	0.7	1.44	.49	.84
7	11	85	0.2	-2.3	.04	5.29	-1.88
8	11	88	0.2	10.7	.04	114.49	2.14
9	10	88	-0.8	10.7	.64	114.49	-8.58
10	8	40	-4.8	-3.3	23.04	10.89	-16.44
11	13	88	3.2	-2.3	10.24	5.29	-20.48
12	9	80	-1.8	-3.3	3.24	10.89	-12.72
13	8	88	-2.8	-2.3	7.84	5.29	32.04
14	--	---	--	--	--	---	---
15	10	80	-0.8	-3.3	.64	10.89	-19.44
16	11	88	0.2	10.7	.04	114.49	2.14
17	14	88	3.2	10.7	10.24	114.49	34.24
18	14	75	3.2	0.7	10.24	.49	3.24
19	11	75	0.2	9.7	.04	.49	.14
20	11	88	0.2	10.7	.04	114.49	2.14
21	8	88	-2.8	10.7	7.84	114.49	-29.98
22	14	98	3.2	20.7	10.24	428.49	66.24
23	8	80	-2.8	-3.3	7.84	10.89	-28.04
24	13	95	3.2	20.7	10.24	428.49	65.84
25	11	75	0.2	0.7	.04	.49	.14
26	9	88	-1.8	10.7	3.24	114.49	-19.28
27	10	88	-0.8	10.7	.64	114.49	-8.58
28	13	75	3.2	0.7	10.24	.49	1.24
29	13	88	3.2	10.7	10.24	114.49	35.84
30	12	80	1.2	-3.3	1.44	10.89	-12.18
31	10	75	-0.8	0.7	.64	.49	-1.28
32	9	88	-1.8	-2.3	3.24	5.29	-17.84
33	12	75	1.2	0.7	1.44	.49	.84
34	10	88	-0.8	10.7	.64	114.49	-8.58
35	9	88	-1.8	-2.3	3.24	5.29	-17.84
36	12	88	1.2	-2.3	1.44	5.29	-11.18
37	11	75	0.2	0.7	.04	.49	.14
38	13	98	3.2	20.7	10.24	428.49	65.84
39	12	95	1.2	20.7	1.44	428.49	24.84
40	12	95	1.2	20.7	1.44	428.49	24.84
41	8	75	-2.8	0.7	7.84	.49	-1.28
42	11	75	0.2	0.7	.04	.49	.14
43	12	88	1.2	10.7	1.44	114.49	12.84
44	11	75	0.2	0.7	.04	.49	.14
45	11	88	0.2	-2.3	.04	5.29	-1.88

TABLE V a (1938)

No.	X	Y	x	y	x ²	y ²	xy
46	15	95	4.2	20.7	17.64	428.49	86.94
47	12	95	1.2	20.7	1.44	428.49	24.84
48	10	50	- 0.8	-24.3	.64	590.49	19.44
49	0	65	-10.8	- 9.3	116.64	86.49	100.44
50	--	--	---	---	---	---	---
51	12	75	1.2	0.7	1.44	.49	.84
52	11	65	0.2	- 9.3	.04	86.49	- 1.86
53	8	95	- 2.8	20.7	7.84	428.49	-57.96
54	11	85	0.2	10.7	.04	114.49	2.14
55	--	--	---	---	---	---	---
56	11	75	0.2	0.7	.04	.49	.14
57	10	75	- 0.8	0.7	.64	.49	- .56
58	13	95	2.2	20.7	4.84	428.49	45.54
59	13	95	2.2	20.7	4.84	428.49	45.54
60	11	65	0.2	- 9.3	.04	86.49	- 1.86
61	10	65	- 0.8	- 9.3	.64	86.49	7.44
62	10	75	-0.8	0.7	.64	.49	- .56
63	9	65	- 1.8	- 9.3	3.24	86.49	16.74
64	8	65	- 2.8	- 9.3	7.84	86.49	26.04
65	10	95	- 0.8	20.7	.64	428.49	- 16.56
66	12	95	1.2	20.7	1.44	428.49	24.84
67	13	85	2.2	10.7	4.84	114.49	23.54
68	10	75	- 0.8	0.7	.64	.49	- .56
69	12	95	1.2	20.7	1.44	428.49	24.84
70	10	75	- 0.8	0.7	.64	.49	- .56
71	11	75	0.2	0.7	.04	.49	.14
72	9	50	- 1.8	-24.3	3.24	590.49	43.74
73	--	--	---	---	---	---	---
74	12	95	1.2	20.7	1.44	428.49	24.84
75	9	75	- 1.8	0.7	3.24	.49	- 1.26
76	8	75	- 2.8	0.7	7.84	.49	- 1.96
77	12	85	1.2	10.7	1.44	114.49	12.84
78	11	95	0.2	20.7	.04	428.49	4.14
79	11	75	0.2	0.7	.04	.49	.14
80	14	85	3.2	10.7	10.24	114.49	34.24
81	11	65	0.2	- 9.3	.04	86.49	- 1.86
82	10	75	- 0.8	0.7	.64	.49	- .56
83	12	85	1.2	10.7	1.44	114.49	12.84
84	13	75	2.2	0.7	4.84	.49	1.54
85	12	65	1.2	- 9.3	1.44	86.49	- 11.16
86	9	95	- 1.8	20.7	3.24	428.49	- 37.26
87	8	50	- 2.8	-24.3	7.84	590.49	68.04
88	13	75	2.2	0.7	4.84	.49	1.54
89	15	85	3.2	10.7	10.24	.49	34.24
90	13	75	2.2	0.7	4.84	.49	1.54
91	7	85	- 3.8	10.7	14.44	114.49	- 40.66
92	18	65	7.2	- 9.3	51.84	86.49	- 66.96
93	9	50	- 1.8	-24.3	3.24	590.49	43.74

TABLE V a (1938)

No.	X	Y	Z	V	X ₂	V ₂	VX
45	15	95	4.4	20.7	17.64	428.44	45.88
46	15	95	2.1	20.7	1.44	428.44	46.44
47	10	80	-0.8	-24.3	.64	429.04	47.12
48	0	65	-10.8	-9.3	115.84	429.84	100.44
49	--	--	--	--	--	--	--
50	15	75	1.2	0.7	1.44	429.44	48.
51	11	65	0.3	-9.3	.04	429.84	48.1 -
52	8	55	-2.8	20.7	7.84	428.44	48.7 -
53	11	45	0.3	10.7	.04	114.44	49.14
54	--	--	--	--	--	--	--
55	11	75	0.3	0.7	.04	429.	49.14
56	10	75	-0.8	0.7	.64	429.	49. -
57	13	65	2.2	20.7	4.84	428.44	49.34
58	13	65	2.2	20.7	4.84	428.44	49.34
59	11	55	0.3	-9.3	.04	429.44	49.1 -
60	10	45	-0.8	-9.3	.64	429.84	49.14
61	10	35	-0.8	0.7	.64	429.	49. -
62	9	25	-1.8	-9.3	3.24	429.84	49.14
63	8	15	-2.8	-9.3	7.84	429.84	49.04
64	10	55	0.8	20.7	.64	428.44	49.14
65	13	45	1.2	20.7	1.44	428.44	49.34
66	13	45	2.2	10.7	4.84	114.44	49.34
67	10	35	-0.8	0.7	.64	429.	49. -
68	13	25	1.2	20.7	1.44	428.44	49.34
69	10	15	-0.8	0.7	.64	429.	49. -
70	11	75	0.3	0.7	.04	429.	49.14
71	11	75	0.3	0.7	.04	429.	49.14
72	9	65	-1.8	-24.3	3.24	429.04	49.14
73	--	--	--	--	--	--	--
74	13	55	1.2	20.7	1.44	428.44	49.34
75	9	45	-1.8	0.7	3.24	429.	49.1 -
76	8	35	-2.8	0.7	7.84	429.	49.1 -
77	13	25	1.2	10.7	1.44	114.44	49.14
78	11	15	0.3	20.7	.04	428.44	49.14
79	11	75	0.3	0.7	.04	429.	49.14
80	14	65	2.2	10.7	10.24	114.44	49.34
81	11	55	0.3	-9.3	.04	429.84	49.1 -
82	10	45	0.8	0.7	.64	429.	49. -
83	13	35	1.2	10.7	1.44	114.44	49.34
84	13	25	2.2	0.7	4.84	429.	49.34
85	13	15	1.2	-9.3	1.44	429.84	49.1 -
86	9	55	-1.8	20.7	3.24	428.44	49.1 -
87	8	45	-2.8	-24.3	7.84	429.04	49.04
88	13	35	2.2	0.7	4.84	429.	49.34
89	13	25	2.2	10.7	10.24	429.	49.34
90	13	15	2.2	0.7	4.84	429.	49.34
91	7	65	-2.8	10.7	14.44	114.44	49.04
92	18	55	-7.2	-9.3	51.84	429.84	49.04
93	9	45	-1.8	-24.3	3.24	429.04	49.14

TABLE V a (1938)

No.	X	Y	x	y	x ²	y ²	xy
94	11	85	0.2	10.7	.04	114.49	2.14
95	--	--	---	---	---	---	---
96	9	75	- 1.8	0.7	3.24	.49	- 1.26
97	12	85	1.2	10.7	1.44	114.49	12.84
98	10	85	- 0.8	10.7	.64	114.49	- 8.56
99	12	65	1.2	- 9.3	1.44	86.49	-11.16
100	10	95	-20.8	20.7	.64	428.49	-16.56
101	11	95	0.2	20.7	.04	428.49	4.14
102	10	85	- 0.8	10.7	.64	114.49	- 8.56
103	13	40	2.2	-34.3	4.84	1176.49	-75.46
104	--	--	---	---	---	---	---
105	9	65	- 1.8	- 9.3	3.24	86.49	16.74
106	9	65	- 1.8	- 9.3	3.24	86.49	16.74
107	11	75	0.2	0.74	.04	.49	.14
108	11	85	0.2	10.3	.04	114.49	6.02
109	--	--	---	---	---	---	---
110	11	50	0.2	-24.3	.04	590.49	- 4.86
111	11	85	0.2	10.7	.04	114.49	2.14
112	13	65	2.2	- 9.3	4.84	86.49	-20.46
113	13	85	2.2	10.7	4.84	114.49	23.54
114	11	95	0.2	20.7	.04	428.49	4.14
115	10	65	- 0.8	- 9.3	.64	86.49	7.44
116	11	40	0.2	-34.3	.04	1176.49	- 6.86
117	8	75	- 2.8	0.7	7.84	.49	- 1.96
118	14	65	3.2	- 9.3	10.24	86.49	-29.76
119	13	95	2.2	20.7	4.84	428.49	45.54
120	9	75	- 1.8	0.7	3.24	.49	- 1.26
121	11	65	0.2	- 9.3	.04	86.49	- 1.86
122	12	95	1.2	20.7	1.44	428.49	24.84
123	11	50	0.2	-24.3	.04	590.49	- 4.86
124	16	95	5.2	20.7	27.04	428.49	107.64
125	12	85	1.2	10.7	1.44	114.49	12.84
126	8	75	- 2.8	0.7	7.84	.49	- 1.96
127	10	65	- 0.8	- 9.3	.64	86.49	7.44
128	14	95	3.2	20.7	10.24	428.49	66.24
129	10	85	- 0.8	10.7	.64	114.49	- 8.56
130	9	85	- 1.8	10.7	3.24	114.49	-19.26
131	12	95	1.2	20.7	1.44	428.49	24.84
132	9	75	- 1.8	0.7	3.24	.49	- 1.26
133	11	95	0.2	20.7	.04	428.49	4.14
134	12	75	1.2	0.7	1.44	.49	.84
135	--	--	---	---	---	---	---
136	13	64	2.2	- 9.3	4.84	86.49	-20.46
137	12	65	1.2	- 9.3	1.44	86.49	-11.16
138	12	85	1.2	10.7	1.44	114.49	12.84
139	7	40	- 3.8	-34.3	14.44	1176.49	130.54
140	14	95	3.2	20.7	10.24	428.49	66.24
141	13	85	2.2	10.7	4.84	114.49	23.54

TABLE V (continued)

No.	A	X	V	X	V	X	V
98	11	88	8.0	10.0	10.0	10.0	10.0
99	11	88	8.0	10.0	10.0	10.0	10.0
100	11	88	8.0	10.0	10.0	10.0	10.0
101	11	88	8.0	10.0	10.0	10.0	10.0
102	11	88	8.0	10.0	10.0	10.0	10.0
103	11	88	8.0	10.0	10.0	10.0	10.0
104	11	88	8.0	10.0	10.0	10.0	10.0
105	11	88	8.0	10.0	10.0	10.0	10.0
106	11	88	8.0	10.0	10.0	10.0	10.0
107	11	88	8.0	10.0	10.0	10.0	10.0
108	11	88	8.0	10.0	10.0	10.0	10.0
109	11	88	8.0	10.0	10.0	10.0	10.0
110	11	88	8.0	10.0	10.0	10.0	10.0
111	11	88	8.0	10.0	10.0	10.0	10.0
112	11	88	8.0	10.0	10.0	10.0	10.0
113	11	88	8.0	10.0	10.0	10.0	10.0
114	11	88	8.0	10.0	10.0	10.0	10.0
115	11	88	8.0	10.0	10.0	10.0	10.0
116	11	88	8.0	10.0	10.0	10.0	10.0
117	11	88	8.0	10.0	10.0	10.0	10.0
118	11	88	8.0	10.0	10.0	10.0	10.0
119	11	88	8.0	10.0	10.0	10.0	10.0
120	11	88	8.0	10.0	10.0	10.0	10.0
121	11	88	8.0	10.0	10.0	10.0	10.0
122	11	88	8.0	10.0	10.0	10.0	10.0
123	11	88	8.0	10.0	10.0	10.0	10.0
124	11	88	8.0	10.0	10.0	10.0	10.0
125	11	88	8.0	10.0	10.0	10.0	10.0
126	11	88	8.0	10.0	10.0	10.0	10.0
127	11	88	8.0	10.0	10.0	10.0	10.0
128	11	88	8.0	10.0	10.0	10.0	10.0
129	11	88	8.0	10.0	10.0	10.0	10.0
130	11	88	8.0	10.0	10.0	10.0	10.0
131	11	88	8.0	10.0	10.0	10.0	10.0
132	11	88	8.0	10.0	10.0	10.0	10.0
133	11	88	8.0	10.0	10.0	10.0	10.0
134	11	88	8.0	10.0	10.0	10.0	10.0
135	11	88	8.0	10.0	10.0	10.0	10.0
136	11	88	8.0	10.0	10.0	10.0	10.0
137	11	88	8.0	10.0	10.0	10.0	10.0
138	11	88	8.0	10.0	10.0	10.0	10.0
139	11	88	8.0	10.0	10.0	10.0	10.0
140	11	88	8.0	10.0	10.0	10.0	10.0
141	11	88	8.0	10.0	10.0	10.0	10.0

TABLE V a (1938)

No.	X	Y	x	y	x ²	y ²	xy
142	12	95	1.2	20.7	1.44	428.49	24.84
143	11	50	0.2	-24.3	.04	590.49	- 4.86
144	11	75	0.2	0.7	.04	.49	.14
145	11	95	0.2	20.7	.04	428.49	4.14
146	11	65	0.2	- 9.3	.04	86.49	- 1.86
147	11	65	0.2	- 9.3	.04	86.49	- 1.86
148	16	95	5.2	20.7	27.04	428.49	107.64
149	10	65	-0.8	- 9.3	.64	86.49	7.44
150	11	75	0.2	0.7	.04	.49	.14
151	18	85	7.2	10.7	51.84	114.49	77.04
152	8	65	-2.8	- 9.3	7.84	86.49	26.04
153	13	75	2.2	0.7	4.84	.49	1.54
154	11	75	0.2	0.7	.04	.49	.14
155	17	95	6.2	20.3	38.44	428.49	125.86
156	11	40	0.2	-34.3	.04	1176.49	- 6.86
157	12	85	1.2	10.7	1.44	114.49	12.84
158	12	85	1.2	10.7	1.44	114.49	12.84
159	12	85	1.2	10.7	1.44	114.49	12.84
160	13	65	2.2	- 9.3	4.84	86.49	- 20.46
161	9	65	-1.8	- 9.3	3.24	86.49	16.74
162	13	50	2.2	-24.3	4.84	590.49	- 53.46
163	12	65	1.2	- 9.3	1.44	86.49	- 11.16
164	10	65	-0.8	- 9.3	.64	86.49	7.44
165	11	85	0.2	10.7	.04	114.49	2.14
166	10	75	-0.8	0.7	.64	.49	- .56
167	11	65	0.2	- 9.3	.04	86.49	- 1.86
168	12	50	1.2	-24.3	1.44	590.49	- 29.16
169	10	65	-0.8	- 9.3	.64	86.49	7.44
170	11	50	0.2	-24.3	.04	590.49	- 4.86
171	9	85	-1.8	10.7	3.24	114.49	- 19.26
172	13	65	2.2	- 9.3	4.84	86.49	- 20.46
173	10	75	-0.8	0.7	.64	.49	- .56
174	12	75	1.2	0.7	1.44	.49	.84
175	9	75	-1.8	0.7	3.24	.49	- 1.26
176	9	50	-1.8	-24.3	3.24	590.49	43.74
177	9	85	-1.8	10.7	3.24	114.49	- 19.26
178	14	85	3.2	10.7	10.24	114.49	34.24
179	14	65	3.2	- 9.3	10.24	86.49	- 29.76
180	10	75	-0.8	0.7	.64	.49	- .56
181	11	75	0.2	0.7	.04	.49	.14
182	12	85	1.2	10.7	1.44	114.49	12.84
183	12	40	1.2	-34.3	1.44	1176.49	- 41.16
184	8	75	-2.8	0.7	7.84	.49	- 1.96
185	12	85	1.2	10.7	1.44	.49	12.84
186	9	75	-1.8	0.7	3.24	.49	- 1.26
187	11	85	0.2	10.7	.04	114.49	2.14
188	--	--	---	---	---	---	---
189	12	95	1.2	20.7	1.44	428.49	24.84

TABLE V (continued)

No.	λ	γ	x	γ	S_x	S_y	V_x
142	12	35	1.2	20.7	1.44	428.44	24.84
143	11	30	0.2	-24.2	0.	320.33	28.4 -
144	11	25	0.2	0.7	0.	44.	41.
145	11	20	0.2	20.7	0.	428.44	41.4
146	11	15	0.2	- 9.2	0.	88.44	38.1 -
147	11	10	0.2	- 9.2	0.	88.44	38.1 -
148	10	35	2.2	20.7	27.04	428.44	107.44
149	10	30	-0.2	- 9.2	0.	88.44	44.7
150	11	25	0.2	0.7	0.	44.	41.
151	10	20	2.2	10.7	51.84	114.44	77.04
152	8	35	-2.2	- 9.2	7.84	88.44	38.04
153	12	25	2.2	0.7	4.84	44.	1.44
154	11	20	0.2	0.7	0.	44.	41.
155	17	35	4.2	20.2	28.44	428.44	123.84
156	11	40	0.2	-24.2	0.	1176.44	6.84 -
157	12	35	1.2	10.7	1.44	114.44	12.84
158	12	30	1.2	10.7	1.44	114.44	12.84
159	12	25	1.2	10.7	1.44	114.44	12.84
160	12	20	2.2	- 9.2	4.84	88.44	20.44 -
161	9	35	-1.2	- 9.2	2.84	88.44	16.74
162	12	30	2.2	-24.2	4.84	320.44	32.44 -
163	12	25	1.2	- 9.2	1.44	88.44	11.16 -
164	10	35	-0.2	- 0.2	0.	32.44	7.44
165	11	30	0.2	10.7	0.	114.44	41.2 -
166	10	25	-0.2	0.7	0.	44.	38.1 -
167	11	20	0.2	- 9.2	0.	88.44	1.84 -
168	12	30	1.2	-24.2	1.44	320.44	32.16 -
169	10	35	-0.2	- 9.2	0.	88.44	7.44
170	11	30	0.2	-24.2	0.	320.44	4.84 -
171	9	35	-1.2	10.7	2.84	114.44	19.24 -
172	12	35	2.2	- 9.2	4.84	88.44	20.44 -
173	10	25	-0.2	0.7	0.	44.	38. -
174	12	25	1.2	0.7	1.44	44.	38. -
175	9	25	-1.2	0.7	2.84	44.	1.24 -
176	9	20	-1.2	2.2	3.84	320.44	42.74
177	9	15	-1.2	10.7	2.84	114.44	19.24 -
178	14	35	2.2	10.7	10.24	114.44	34.24
179	14	30	2.2	- 9.2	10.24	88.44	29.74 -
180	10	25	-0.2	0.7	0.	44.	38. -
181	11	20	0.2	0.7	0.	44.	41.
182	12	35	1.2	10.7	1.44	114.44	12.84
183	12	30	1.2	-24.2	1.44	1176.44	41.16 -
184	8	25	-2.2	0.7	7.84	44.	38.1 -
185	12	20	1.2	10.7	1.44	44.	12.84
186	9	25	-1.2	0.7	2.84	44.	1.24 -
187	11	35	0.2	10.7	0.	114.44	41.24
188	--	--	--	--	--	--	--
189	12	35	1.2	20.7	1.44	428.44	24.84

TABLE V a (1938)

No.	X	Y	x	y	x ²	y ²	xy
190	13	65	2.2	- 9.3	4.84	86.49	- 20.46
191	7	65	-3.8	- 9.3	14.44	86.49	35.34
192	11	85	0.8	10.7	.64	114.49	8.56
193	11	85	0.8	10.7	.64	114.49	8.56
194	9	65	-1.8	- 9.3	3.24	86.49	16.74
195	12	85	1.2	10.7	1.44	114.49	12.84
196	15	85	4.2	10.7	17.64	114.49	44.94
197	12	75	1.2	0.7	1.44	.49	.84
198	10	40	-0.8	-34.3	.64	1176.49	27.44
199	11	75	0.2	0.7	.04	.49	.14
200	10	65	-0.8	- 9.3	.64	86.49	7.44
201	11	85	0.2	10.7	.04	114.49	2.14
202	10	95	-0.8	20.7	.64	428.49	- 16.56
203	14	95	3.2	20.7	10.24	428.49	66.24
204	11	65	0.2	- 9.3	.04	86.49	- 1.86
205	13	85	2.2	10.7	3.24	114.49	23.54
206	11	85	0.2	10.7	.04	114.49	2.14
207	--	--	---	---	---	---	---
208	12	75	1.2	0.7	1.44	.49	.84
209	11	65	0.2	- 9.3	.04	86.49	- 1.86
210	9	95	-1.8	20.7	3.24	428.49	- 37.26
211	12	65	1.2	- 9.3	1.44	86.49	- 11.16
212	15	85	4.2	10.7	17.64	114.49	44.94
213	11	75	0.2	0.7	.04	.49	.14
214	11	65	0.2	- 9.3	.04	86.49	- 1.86
215	8	65	-2.8	- 9.3	7.84	86.49	26.04
216	14	75	3.2	0.7	10.24	.49	2.24
217	11	95	0.2	20.7	.04	428.49	4.14
218	11	75	0.2	0.7	.04	.49	.14
219	11	65	0.2	- 9.3	.04	86.49	- 1.86
220	13	65	2.2	- 9.3	3.24	86.49	- 20.46
221	10	75	-0.8	0.7	.64	.49	- .56
222	9	65	-1.8	- 9.3	.64	86.49	16.74
223	9	75	-1.8	0.7	3.24	.49	- 1.26
224	12	65	1.2	- 9.3	1.44	86.49	- 11.16
225	8	65	-2.8	- 9.3	7.84	86.49	26.04
226	12	85	1.2	10.7	1.44	114.49	12.84
227	6	50	-4.8	-24.3	23.04	590.49	116.64
228	12	50	1.2	-24.3	1.44	590.49	- 29.16
229	12	85	1.2	10.7	1.44	114.49	12.84
230	12	95	1.2	20.7	1.44	428.49	24.84
231	13	85	2.2	10.7	3.24	114.49	23.54
232	12	75	1.2	0.7	1.44	.49	.84
233	11	65	0.2	- 9.3	.04	86.49	- 1.86
234	5	40	-5.8	-34.3	33.64	1176.49	198.94
235	10	85	-0.8	10.7	.64	114.49	- 8.56
236	13	75	2.2	0.7	4.84	.49	1.54
237	9	50	-1.8	-24.3	3.24	590.49	43.74

TABLE V a (1938)

No.	X	Y	Z	V	X ²	Y ²	V ²
190	18	65	8.8	- 8.8	34.4	4225	77.44
191	7	55	- 8.8	- 8.8	34.4	3025	77.44
192	11	65	0.8	10.7	34.	4225	114.49
193	11	65	0.8	10.7	34.	4225	114.49
194	9	55	- 1.8	- 9.8	32.4	3025	96.04
195	13	65	1.8	10.7	34.4	4225	114.49
196	13	65	4.8	10.7	34.4	4225	114.49
197	13	75	1.8	0.7	1.44	5625	0.49
198	10	40	- 0.8	- 34.8	34.	1600	1211.04
199	11	75	0.8	0.7	34.	5625	0.49
200	10	65	- 0.8	- 9.8	34.	4225	96.04
201	11	65	0.8	10.7	34.	4225	114.49
202	10	55	- 0.8	- 30.7	34.	3025	96.04
203	14	55	8.8	30.7	10.24	3025	1044.64
204	11	65	0.8	- 9.8	34.	4225	96.04
205	13	65	8.8	10.7	32.4	4225	114.49
206	11	65	0.8	10.7	34.	4225	114.49
207	--	--	--	--	--	--	--
208	13	75	1.8	0.7	1.44	5625	0.49
209	11	65	0.8	- 9.8	34.	4225	96.04
210	9	55	- 1.8	- 30.7	32.4	3025	96.04
211	13	65	1.8	- 9.8	1.44	4225	114.49
212	13	65	4.8	10.7	17.64	4225	114.49
213	11	75	0.8	0.7	34.	5625	0.49
214	11	65	0.8	- 9.8	34.	4225	96.04
215	8	65	- 8.8	- 9.8	7.84	4225	96.04
216	14	75	8.8	0.7	10.24	5625	0.49
217	11	65	0.8	30.7	34.	4225	114.49
218	11	75	0.8	0.7	34.	5625	0.49
219	11	65	0.8	- 9.8	34.	4225	96.04
220	13	65	8.8	- 9.8	32.4	4225	114.49
221	10	75	- 0.8	0.7	34.	5625	0.49
222	9	65	- 1.8	- 9.8	32.4	4225	96.04
223	9	75	- 1.8	0.7	32.4	5625	0.49
224	13	65	1.8	- 9.8	1.44	4225	114.49
225	8	65	- 8.8	- 9.8	7.84	4225	96.04
226	13	65	1.8	10.7	1.44	4225	114.49
227	8	60	- 4.8	- 34.8	30.24	3600	1211.04
228	13	60	1.8	- 34.8	1.44	3600	1211.04
229	13	65	1.8	10.7	1.44	4225	114.49
230	13	65	1.8	30.7	1.44	4225	114.49
231	13	65	8.8	10.7	32.4	4225	114.49
232	13	75	1.8	0.7	1.44	5625	0.49
233	11	65	0.8	- 9.8	34.	4225	96.04
234	8	40	- 8.8	- 34.8	32.4	1600	1211.04
235	10	65	- 0.8	10.7	34.	4225	114.49
236	13	75	8.8	0.7	4.84	5625	0.49
237	9	60	- 1.8	- 34.8	32.4	3600	1211.04

TABLE V a (1938)

No.	X	Y	x	y	x ²	y ²	xy
238	8	50	-2.8	-24.3	7.84	590.49	680.40
239	10	75	-0.8	0.7	.64	.49	-.56
228	2477	17040			1035.88	47299.72	3133.67

10.8 74.3

$$r = \frac{\sum xy}{\sqrt{\sum x^2} \times \sqrt{\sum y^2}} = \frac{3,133.67}{\sqrt{1,035.88} \times \sqrt{42,299.72}}$$

$$r = \frac{3,133.67}{32.18 \times 205.67} = \frac{3,133.67}{6,618.46} = .47$$

$$P.E._r = \frac{.6745 \times (1-r^2)}{\sqrt{N}} = \frac{.6745 \times (1-.2209)}{\sqrt{228}}$$

$$= \frac{.5255}{15.09} = .034$$

TABLE V b

Correlation Between the Arithmetic Section
of the Army Alpha and Algebra Grades

No.	X	Y	x	y	x ²	y ²	xy
37-1	9	Same	-2.3	- 9.7	5.29	Same as	22.31
2	11	as in	- .3	.3	.09	in Table	- .09
3	11	Table	- .3	.3	.09	III(b)	- .09
4	9	III(B)	-2.3	20.3	5.29		-46.69
5	12		.7	.3	.49		.21
6	10		-1.3	10.3	1.69		-13.39
7	10		-1.3	-24.7	1.69		32.11
8	10		-1.3	.3	1.69		- .39
9	10		-1.3	10.3	1.69		-13.39
10	10		-1.3	-39.7	1.69		51.61
11	12		.7	.3	.49		.21
12	9		-2.3	.3	5.29		- .69
13	11		- .3	10.3	.09		- 3.09
14	8		-3.3	- 9.7	10.89		32.01
15	11		- .3	10.3	.09		- 3.09
16	8		-3.3	.3	10.89		- .99
17	13		1.7	.3	2.89		.51
18	11		- .3	10.3	.09		- 3.09
19	12		.7	.3	.49		.21
20	10		-1.3	- 9.7	1.69		12.61
21	11		- .3	20.3	.09		- 6.09
22	12		.7	10.3	.49		7.21
23	13		1.7	10.3	2.89		17.51
24	13		1.7	- 9.7	2.89		-16.49
25	13		1.7	.3	2.89		.51
26	11		- .3	10.3	.09		- 3.09
27	11		- .3	-24.7	.09		7.41
28	13		1.7	10.3	2.89		17.51
29	12		.7	-24.7	.49		-17.29
30	13		1.7	10.3	2.89		17.51
31	9		-2.3	-24.7	5.29		56.81
32	10		-1.3	10.3	1.69		-13.39
33	9		-2.3	.3	5.29		- .69
34	13		1.7	10.3	2.89		17.51
35	10		-1.3	10.3	1.69		13.39
36	13		1.7	- 9.7	2.89		-16.47
37	11		- .3	10.3	.09		- 3.09
38	11		- .3	- 9.7	.09		2.91
39	12		.7	.3	.49		.21
40	8		-3.3	.3	10.89		- .99
41	12		.7	- 9.7	.49		- 6.79
42	11		- .3	.3	.09		- .09
43	10		-1.3	10.3	1.69		-13.39
44	16		4.7	10.3	22.09		48.41
45	17		5.7	10.3	32.49		58.71
46	15		3.7	.3	13.69		1.11

TABLE V
Correlation Between the Arithmetic Section
of the Army Alpha and Algebra Grades

No.	X	Y	X	Y	X ²	Y ²	XY
27-1	9	Same	-5.3	-9.7	5.29	Same as	28.21
2	11	as in	-3.3	3.	.09	in Table	-
3	11	Table	-3.3	3.	.09	III(d)	-
4	9	III(e)	-5.3	20.3	5.29		-46.69
5	12		7.	3.	.49		.21
6	10		-1.3	-10.3	1.69		-13.39
7	10		-1.3	-24.7	1.69		23.11
8	10		-1.3	3.	1.69		-13.39
9	10		-1.3	10.3	1.69		-13.39
10	10		-1.3	-39.7	1.69		21.61
11	12		7.	3.	.49		.21
12	9		-5.3	3.	5.29		.69
13	11		-3.3	10.3	.09		-3.09
14	8		-5.3	-9.7	10.89		28.01
15	11		-3.3	10.3	.09		-3.09
16	8		-5.3	3.	10.89		-9.99
17	13		1.7	3.	8.89		.21
18	11		-3.3	10.3	.09		-3.09
19	12		7.	3.	.49		.21
20	10		-1.3	-9.7	1.69		13.61
21	11		-3.3	20.3	.09		-6.09
22	12		7.	10.3	.49		7.21
23	13		1.7	10.3	8.89		17.51
24	13		1.7	-9.7	8.89		-16.49
25	13		1.7	3.	8.89		.21
26	11		-3.3	10.3	.09		-3.09
27	11		-3.3	-24.7	.09		7.41
28	13		1.7	10.3	8.89		17.51
29	12		7.	-24.7	.49		-17.29
30	13		1.7	10.3	8.89		17.51
31	9		-5.3	-24.7	5.29		28.81
32	10		-1.3	10.3	1.69		-13.39
33	9		-5.3	3.	5.29		.69
34	13		1.7	10.3	8.89		17.51
35	10		-1.3	10.3	1.69		13.39
36	13		1.7	-9.7	8.89		-16.47
37	11		-3.3	10.3	.09		-3.09
38	11		-3.3	-9.7	.09		2.91
39	12		7.	3.	.49		.21
40	8		-5.3	3.	10.89		-9.99
41	12		7.	-9.7	.49		-6.79
42	11		-3.3	3.	.09		.09
43	10		-1.3	10.3	1.69		-13.39
44	12		7.	10.3	8.89		48.41
45	17		2.7	10.3	32.49		38.71
46	12		7.	3.	12.69		1.11

TABLE V b

No.	X	Y	x	y	x ²	y ²	xy
47	9	Same	-2.3	- 9.7	5.29	Same	22.31
48	14	as in	2.7	- 9.7	7.29	as in	26.19
49	12	Table	.7	- 9.7	.49	Table	- 6.79
50	9	III (b)	-2.3	- 9.7	5.29	III (b)	22.31
51	--		---	---	---		---
52	10		-1.3	20.3	1.69		-26.39
53	11		- .3	- 9.7	.09		2.91
54	10		-1.3	-24.7	1.69		32.11
55	14		2.7	- 9.7	7.29		-26.19
56	11		- .3	20.3	.09		- 6.09
57	13		1.7	10.3	2.89		17.51
58	17		5.7	10.3	32.49		58.71
59	13		1.7	.3	2.89		.51
60	10		-1.3	-24.7	1.69		32.11
61	9		-2.3	10.3	5.29		-43.69
62	13		1.7	10.3	2.89		17.51
63	13		1.7	10.3	2.89		17.51
64	12		.7	10.3	.49		7.21
65	--		---	---	---		---
66	6		-5.3	- 9.7	28.09		51.41
67	14		2.7	20.3	7.29		54.81
68	11		- .3	.3	.09		- .09
69	15		3.7	- 9.7	13.69		-35.89
70	13		1.7	10.3	2.89		17.51
71	5		-6.3	-24.7	39.69		155.61
72	11		- .3	20.3	.09		- 6.09
73	11		- .3	- 9.7	.09		2.91
74	15		3.7	.3	13.69		1.11
75	13		1.7	10.3	2.89		17.51
76	16		4.7	.3	22.09		1.41
77	9		-2.3	- 9.7	5.29		22.31
78	13		1.7	.3	2.89		.51
79	13		1.7	.3	2.89		.51
80	8		-3.3	- 9.7	10.89		32.01
81	8		-3.3	- 9.7	10.89		32.01
82	12		.7	- 9.7	.49		- 6.79
83	12		.7	10.3	.49		7.21
84	10		-1.3	- 9.7	1.69		12.61
85	11		- .3	20.3	.09		- 6.09
86	8		-3.3	10.3	10.89		-33.99
87	12		.7	20.3	.49		14.21
88	11		- .3	.3	.09		- .09
89	11		- .3	-24.7	.09		7.41
90	13		1.7	.3	2.89		.51
91	11		- .3	10.3	.09		- 3.09
92	10		-1.3	-39.7	1.69		51.61
93	9		-2.3	10.3	5.29		-43.69
94	10		-1.3	- 9.7	1.69		12.61
95	11		- .3	20.3	.09		- 6.09

TABLE V b

No.	X	Y	x	y	x ²	y ²	xy
47	9	Same	-2.2	- 9.7	5.29	Same	52.31
48	14	as in	2.7	- 9.7	7.29	as in	52.19
49	12	Table	.7	- 9.7	.49	Table	- 8.79
50	9	III (a)	-2.2	- 9.7	5.29	III (a)	52.31
51	--	--	--	--	--	--	--
52	10		-1.3	20.3	1.69		-52.32
53	11		- .3	- 9.7	.09		2.31
54	10		-1.3	-24.7	1.69		52.11
55	14		2.7	- 9.7	7.29		-52.19
56	11		- .3	20.3	.09		- 8.09
57	12		1.7	10.3	2.89		17.51
58	17		2.7	10.3	22.49		52.71
59	15		1.7	.3	2.89		.31
60	10		-1.3	-24.7	1.69		32.11
61	9		-2.2	10.3	5.29		-42.69
62	12		1.7	10.3	2.89		17.51
63	15		1.7	10.3	2.89		17.51
64	12		.7	10.3	.49		7.81
65	--	--	--	--	--	--	--
66	6		-2.2	- 9.7	52.09		51.41
67	14		2.7	20.3	7.29		54.81
68	11		- .3	.3	.09		- .09
69	15		2.7	- 9.7	13.49		-22.99
70	12		1.7	10.3	2.89		17.51
71	5		-2.2	-24.7	32.49		102.61
72	11		- .3	20.3	.09		- 8.09
73	14		- .3	- 9.7	.09		2.31
74	12		2.7	.3	13.49		1.11
75	12		1.7	10.3	2.89		17.51
76	16		4.7	.3	22.09		1.41
77	9		-2.2	- 9.7	5.29		52.31
78	12		1.7	.3	2.89		.31
79	12		1.7	.3	2.89		.31
80	8		-2.2	- 9.7	10.89		32.01
81	8		-2.2	- 9.7	10.89		32.01
82	12		.7	- 9.7	.49		- 8.79
83	12		.7	10.3	.49		7.81
84	10		-1.3	- 9.7	1.69		12.61
85	11		- .3	20.3	.09		- 8.09
86	8		-2.2	10.3	10.89		-32.99
87	12		.7	20.3	.49		12.61
88	11		- .3	.3	.09		- .09
89	11		- .3	-24.7	.09		7.41
90	12		1.7	.3	2.89		.31
91	11		- .3	10.3	.09		- 8.09
92	10		-1.3	-22.7	1.69		51.61
93	9		-2.2	10.3	5.29		-42.69
94	10		-1.3	- 9.7	1.69		12.61
95	11		- .3	20.3	.09		- 8.09

TABLE V b

No.	X	Y	x	y	x ²	y ²	xy
96	7	Same	-4.3	.3	18.49	Same	- 1.29
97	12	as in	.7	- 9.7	.49	as in	- 6.79
98	16	Table	4.7	10.3	22.09	Table	48.41
99	9	III (b)	-2.3	.3	5.29	III (b)	- .69
100	11		- .3	20.3	.09		- 6.09
101	11		- .3	.3	.09		- .09
102	13		1.7	10.3	2.89		17.51
103	12		.7	20.3	.49		14.21
104	13		1.7	.3	2.89		.51
105	13		1.7	10.3	2.89		17.51
106	10		-1.3	10.3	1.69		-13.39
107	8		-3.3	- 9.7	10.89		32.01
108	9		-2.3	20.3	5.29		-46.69
109	13		1.7	- 9.7	2.89		-16.49
110	15		3.7	- 9.7	13.69		-35.89
111	12		.7	10.3	.49		7.21
112	10		-1.3	.3	1.69		- .39
113	13		1.7	- 9.7	2.89		-16.49
114	11		- .3	20.3	.09		- 6.09
115	14		2.7	10.3	7.29		27.81
116	10		-1.3	.3	1.69		- .39
117	11		- .3	- 9.7	.09		2.91
118	18		6.7	-24.7	44.89		-165.49
119	14		2.7	20.3	7.29		54.81
120	14		2.7	.3	7.29		.81
121	12		.7	- 9.7	.49		- 6.79
122	11		- .3	-39.7	.09		11.91
123	11		- .3	.3	.09		- .09
124	12		.7	10.3	.49		7.21
125	11		- .3	- 9.7	.09		2.91
126	10		-1.3	10.3	1.69		-13.39
127	14		2.7	10.3	7.29		27.81
128	8		-3.3	10.3	10.89		-33.99
129	7		-4.3	10.3	18.49		-44.29
130	8		-3.3	10.3	10.89		-33.99
131	10		-1.3	-24.7	1.69		32.11
132	12		.7	20.3	.49		14.21
133	11		- .3	- 9.7	.09		2.91
134	9		-2.3	.3	5.29		- .69
135	13		1.7	10.3	2.89		17.51
136	12		.7	20.3	.49		14.21
137	9		-2.3	-24.7	5.29		56.81
138	11		- .3	- 9.7	.09		2.91
139	9		-2.3	10.3	5.29		-23.69
140	11		- .3	- 9.7	.09		2.91
141	10		-1.3	.3	1.69		- .39
142	14		2.7	- 9.7	7.29		-26.19
143	12		.7	20.3	.49		14.21
144	9		-2.3	20.3	5.29		-46.69
145	11		- .3	10.3	.09		- 3.09

TABLE V b

No.	X	Y	x	y	x ²	y ²	xy
143	11	-	3	10.3	.09	10.6	-3.09
144	9	-8.3	3	80.3	9	80.3	-24.89
145	18	7	7	20.3	49	20.3	14.81
146	14	8.7	8.7	75.81	75.81	75.81	126.19
147	10	-1.3	3	9	1.69	9	-3.9
148	11	-	3	12.1	.09	12.1	-3.91
149	9	-8.3	3	80.3	9	80.3	-24.89
150	14	8.7	8.7	75.81	75.81	75.81	126.19
151	18	7	7	20.3	49	20.3	14.81
152	11	-	3	12.1	.09	12.1	-3.91
153	11	-	3	12.1	.09	12.1	-3.91
154	9	-8.3	3	80.3	9	80.3	-24.89
155	13	1.7	1.7	16.9	2.89	16.9	2.89
156	10	-1.3	3	9	1.69	9	-3.9
157	14	8.7	8.7	75.81	75.81	75.81	126.19
158	11	-	3	12.1	.09	12.1	-3.91
159	7	-6.3	3	49	9	49	-18.9
160	8	-3.3	3	64	9	64	-26.4
161	10	-1.3	3	100	9	100	-32.7
162	13	1.7	1.7	169	2.89	169	46.69
163	18	7	7	324	49	324	226.8
164	11	-	3	121	9	121	-39.9
165	11	-	3	121	9	121	-39.9
166	14	8.7	8.7	196	75.81	196	172.81
167	14	8.7	8.7	196	75.81	196	172.81
168	18	7	7	324	49	324	226.8
169	13	1.7	1.7	169	2.89	169	46.69
170	15	3.7	3.7	225	13.69	225	108.9
171	18	7	7	324	49	324	226.8
172	12	-	3	144	9	144	-42.9
173	13	1.7	1.7	169	2.89	169	46.69
174	13	1.7	1.7	169	2.89	169	46.69
175	13	1.7	1.7	169	2.89	169	46.69
176	13	1.7	1.7	169	2.89	169	46.69
177	13	1.7	1.7	169	2.89	169	46.69
178	13	1.7	1.7	169	2.89	169	46.69
179	13	1.7	1.7	169	2.89	169	46.69
180	13	1.7	1.7	169	2.89	169	46.69
181	13	1.7	1.7	169	2.89	169	46.69
182	13	1.7	1.7	169	2.89	169	46.69
183	13	1.7	1.7	169	2.89	169	46.69
184	13	1.7	1.7	169	2.89	169	46.69
185	13	1.7	1.7	169	2.89	169	46.69
186	13	1.7	1.7	169	2.89	169	46.69
187	13	1.7	1.7	169	2.89	169	46.69
188	13	1.7	1.7	169	2.89	169	46.69
189	13	1.7	1.7	169	2.89	169	46.69
190	13	1.7	1.7	169	2.89	169	46.69
191	13	1.7	1.7	169	2.89	169	46.69
192	13	1.7	1.7	169	2.89	169	46.69
193	13	1.7	1.7	169	2.89	169	46.69
194	13	1.7	1.7	169	2.89	169	46.69
195	13	1.7	1.7	169	2.89	169	46.69
196	13	1.7	1.7	169	2.89	169	46.69
197	13	1.7	1.7	169	2.89	169	46.69
198	13	1.7	1.7	169	2.89	169	46.69
199	13	1.7	1.7	169	2.89	169	46.69
200	13	1.7	1.7	169	2.89	169	46.69

TABLE V b

No.	X	Y	x	y	x ²	y ²	xy
146	12	Same	.7	10.3	.49	Same	7.21
147	7	as in	-4.3	.3	18.49	as in	- 1.29
148	11	Table	-.3	- 9.7	.09	Table	2.91
149	11	III (b)	-.3	.3	.09	III (b)	- .09
150	--		--	--	--		--
151	14		2.7	24.3	7.29		.81
152	9		-2.3	.3	5.29		- .69
153	11		-.3	10.3	.09		- 3.09
154	11		-.3	10.3	.09		- 3.09
155	11		-.3	10.3	.09		- .09
156	13		1.7	10.3	2.89		17.51
157	16		4.7	10.3	22.09		1.41
158	10		-1.3	- 9.3	1.69		- .39
159	11		-.3	10.3	.09		- .09
160	9		-2.3	10.3	5.29		- .69
161	10		-1.3	10.3	1.69		-13.39
162	11		-.3	10.3	.09		- .09
163	10		-1.3	10.3	1.69		- .39
164	15		3.7	-24.7	13.69		-91.39
165	12		.7	-24.7	.49		-17.29
166	12		.7	10.3	.49		.21
167	9		-2.3	-24.7	5.29		56.81
168	14		2.7	20.3	7.29		54.81
169	10		-1.3	.3	1.69		- .39
170	8		-3.3	10.3	10.89		-33.99
171	9		-2.3	10.3	5.29		-23.69
172	12		.7	20.3	.49		14.21
173	8		-3.3	- 9.7	10.89		32.01
174	13		1.7	.3	2.89		.51
175	12		.7	10.3	.49		7.21
176	13		1.7	- 9.7	2.89		-16.49
177	14		2.7	10.3	7.29		54.81
178	8		-3.3	- 9.7	10.89		32.01
179	15		3.7	10.3	13.69		38.11
180	5		-6.3	10.3	39.69		-64.89
181	12		.7	10.3	.49		7.21
182	11		-.3	10.3	.09		- 3.09
183	14		2.7	.3	7.29		.81
184	10		-1.3	- 9.7	1.69		12.61
185	7		-4.3	10.3	18.49		-44.29
186	14		2.7	10.3	7.29		.81
187	13		1.7	10.3	2.89		17.51
188	15		3.7	10.3	13.69		38.11
189	9		-2.3	10.3	5.29		-23.69
190	16		4.7	20.3	22.09		95.41
191	12		.7	10.3	.49		7.21
192	13		1.7	-24.7	2.89		-41.99
193	9		-2.3	-24.7	5.29		56.81
194	12		.7	10.3	.49		7.21
195	13		1.7	.3	2.89		.51

TABLE V d

No.	X	Y	x	y	x ²	y ²	xy
146	18	Game	7	10.3	.49		7.21
147	7	as in	-4.3	3	18.49		-1.29
148	11	Table	-3	-9.7	.09		2.91
149	11	III (p)	-3	3	.09		-.09
150	--	--	--	--	--		--
151	14		2.7	3	7.29		.81
152	9		-2.3	3	5.29		-.69
153	11		-3	10.3	.09		-3.09
154	11		-3	10.3	.09		-3.09
155	11		-3	3	.09		-.09
156	13		1.7	10.3	2.89		17.51
157	16		4.7	3	22.09		1.41
158	10		-1.3	3	1.69		-.39
159	11		-3	3	.09		-.09
160	9		-2.3	3	5.29		-.69
161	10		-1.3	10.3	1.69		-13.39
162	11		-3	3	.09		-.09
163	10		-1.3	3	1.69		-.39
164	13		2.7	-24.7	7.29		-31.39
165	13		7	-24.7	.49		-17.69
166	13		7	3	.49		.81
167	9		-2.3	-24.7	5.29		26.81
168	14		2.7	20.3	7.29		26.81
169	10		-1.3	3	1.69		-.39
170	8		-2.3	10.3	5.29		-23.69
171	9		-2.3	10.3	5.29		-23.69
172	13		7	20.3	.49		14.81
173	8		-2.3	-9.7	5.29		32.01
174	13		1.7	3	2.89		.81
175	13		7	10.3	.49		7.21
176	13		1.7	-9.7	2.89		-16.49
177	14		2.7	10.3	7.29		26.81
178	8		-2.3	-9.7	5.29		32.01
179	16		3.7	10.3	13.69		38.11
180	2		-2.3	10.3	5.29		-64.89
181	12		7	10.3	.49		7.21
182	11		-3	10.3	.09		-3.09
183	14		2.7	3	7.29		.81
184	10		-1.3	-9.7	1.69		16.41
185	7		-4.3	10.3	18.49		-44.29
186	14		2.7	3	7.29		.81
187	13		1.7	10.3	2.89		17.51
188	12		2.7	10.3	7.29		38.11
189	9		-2.3	10.3	5.29		-23.69
190	16		4.7	20.3	22.09		32.41
191	13		7	10.3	.49		7.21
192	13		1.7	-24.7	2.89		-41.99
193	9		-2.3	-24.7	5.29		26.81
194	13		7	10.3	.49		7.21
195	13		1.7	3	2.89		.81

TABLE V b

No.	X	Y	x	y	x ²	y ²	xy
196	13	Same	1.7	10.3	2.89	Same	.51
197	11	as in	-.3	- 9.7	.09	as in	2.91
198	14	Table	2.7	20.3	7.29	Table	.81
199	10	III (b)	-1.3	20.3	1.69	III (b)	-26.39
200	9		-2.3	- 9.7	5.29		22.31
201	11		-.3	-24.7	.09		7.41
202	9		-2.3	20.3	5.29		-.69
203	13		1.7	10.3	2.89		.51
204	10		-1.3	20.3	1.69		-26.39
205	11		-.3	10.3	.09		- 3.09
206	8		-3.3	- 9.7	10.89		32.01
207	10		-1.3	10.3	1.69		-13.39
208	9		-2.3	- 9.7	5.29		22.31
209	12		.7	20.3	.49		14.21
210	12		.7	10.3	.49		7.21
211	6		-5.3	10.3	28.09		- 1.59
212	8		-3.3	10.3	10.89		-33.99
213	12		.7	10.3	.49		7.21
214	10		-1.3	10.3	1.69		-13.39
215	12		.7	- 9.7	.49		- 6.79
216	11		-.3	10.3	.09		- 3.09
217	14		2.7	- 9.7	7.29		-26.19
218	18		6.7	20.3	44.89		136.01
219	12		.7	- 9.7	.49		- 6.79
220	12		.7	10.3	.49		7.21
221	11		-.3	.3	.09		-.09
222	15		3.7	10.3	13.69		38.11
223	5		-6.3	10.3	39.69		64.89
224	9		-2.3	- 9.7	5.29		22.31
225	12		.7	10.3	.49		7.21
226	11		-.3	-24.7	.09		7.41
227	15		3.7	10.3	13.69		38.11
228	12		.7	10.3	.49		7.21
229	--		--	---	---		---
230	15		3.7	10.3	13.69		38.11
231	12		.7	-24.7	.49		-17.29
232	11		-.3	-24.7	.09		7.41
233	15		3.7	10.3	13.69		.81
234	9		-2.3	10.3	5.29		-23.69
235	16		4.7	10.3	22.09		48.41
236	13		1.7	10.3	2.89		17.51
237	10		-1.3	- 9.7	1.69		12.61
238	11		-.3	10.3	.09		- 3.09
239	11		-.3	10.3	.09		- 3.09
240	13		1.7	10.3	2.89		.51
241	13		1.7	20.3	2.89		34.51
242	13		1.7	- 9.7	2.89		-16.49
243	13		1.7	20.3	2.89		34.51
244	12		.7	10.3	.49		7.21
245	10		-1.3	.3	1.69		-.39

TABLE V

No.	X	Y	X	Y	S _x	S _y	xy
196	15	Same	1.7	3.	8.88	Same	21.
197	11	as in	- 3.	- 2.7	.08	as in	8.91
198	14	Table	3.7	3.	7.83	Table	18.
199	10	III (b)	-1.3	20.3	1.63	III (b)	-86.33
200	9		-3.3	- 2.7	2.83		23.31
201	11		- 3.	-24.7	.08		7.41
202	9		-3.3	3.	3.83		-
203	13		1.7	3.	3.83		21.
204	10		-1.3	20.3	1.63		-86.33
205	11		- 3.	10.3	.08		- 3.09
206	8		-3.3	- 2.7	10.83		23.01
207	10		-1.3	10.3	1.63		-13.33
208	9		-3.3	- 2.7	2.83		23.31
209	13		7.	20.3	.43		14.81
210	13		7.	10.3	.43		7.81
211	8		-3.3	3.	28.03		- 1.53
212	8		-3.3	10.3	10.83		-33.93
213	13		7.	10.3	.43		7.81
214	10		-1.3	10.3	1.63		-13.33
215	13		7.	- 2.7	.43		- 6.73
216	11		- 3.	10.3	.08		- 3.09
217	14		3.7	- 2.7	7.83		-23.13
218	18		6.7	20.3	44.83		133.01
219	13		7.	- 2.7	.43		- 6.73
220	13		7.	10.3	.43		7.81
221	11		- 3.	3.	.08		-
222	13		3.7	10.3	13.63		58.11
223	5		-3.3	10.3	39.63		64.83
224	9		-3.3	- 2.7	2.83		23.31
225	13		7.	10.3	.43		7.81
226	11		- 3.	-24.7	.08		7.41
227	13		3.7	10.3	13.63		58.11
228	13		7.	10.3	.43		7.81
229	--		--	--	--		--
230	13		3.7	10.3	13.63		58.11
231	13		7.	-24.7	.43		-17.53
232	11		- 3.	-24.7	.08		7.41
233	13		3.7	3.	13.63		18.
234	9		-3.3	10.3	2.83		-23.33
235	16		4.7	10.3	28.03		48.41
236	13		1.7	10.3	3.83		17.51
237	10		-1.3	- 2.7	1.63		13.31
238	11		- 3.	10.3	.08		- 3.09
239	11		- 3.	10.3	.08		- 3.09
240	13		1.7	3.	3.83		21.
241	13		1.7	20.3	3.83		34.81
242	13		1.7	- 2.7	3.83		-16.43
243	13		1.7	20.3	3.83		34.81
244	13		7.	10.3	.43		7.81
245	10		-1.3	3.	1.63		-

TABLE V b

No.	X	Y	x	y	x ²	y ²	xy
246	15	Same	3.7	10.3	13.69	Same	38.11
247	9	as in	-2.3	-24.7	5.29	as in	56.81
248	12	Table	.7	20.3	.49	Table	14.21
249	9	III (b)	-2.3	.3	5.29	III (b)	-.69
250	9		-2.3	-9.7	5.29		22.31
251	7		-4.3	10.3	18.49		-44.29
252	11		-.3	20.3	.09		-6.09
253	7		-4.3	-9.7	18.49		41.71
254	14		2.7	20.3	7.29		54.81
255	12		.7	10.3	.49		7.21
256	15		3.7	20.3	13.69		75.11
257	11		-.3	-39.7	.09		11.91
258	11		-.3	10.3	.09		-3.09
259	14		2.7	20.3	7.29		54.81
260	9		-2.3	10.3	5.29		-23.69
261	--		--	---	---		---
262	11		-.3	.3	.09		-.09
263	9		-2.3	-9.7	5.29		22.31
264	10		-1.3	20.3	1.69		-26.39
265	11		-.3	20.3	.09		-6.09
266	9		-2.3	-9.7	5.29		22.33
267	12		.7	.3	.49		.21
268	12		.7	-9.7	.49		-6.79
269	12		.7	.3	.49		.21
270	15		3.7	-9.7	13.69		-35.89
271	12		.7	.3	.49		.21
272	12		.7	.3	.49		.21
273	10		-1.3	10.3	1.69		-13.39
274	9		-2.3	.3	5.29		-.69
275	10		-1.3	-9.7	1.69		12.61
276	9		-2.3	.3	5.29		-.69
277	12		.7	.3	.49		.21
278	12		.7	20.3	.49		14.21
279	9		-2.3	10.3	5.29		-23.69
280	10		-1.3	.3	1.69		-.39
281	9		-2.3	.3	5.29		-.69
282	12		.7	.3	.49		.21
283	14		2.7	10.3	7.29		27.81
284	14		2.7	20.3	7.29		54.81
285	10		-1.3	.3	1.69		-.39
286	12		.7	.3	.49		.21
287	9		-2.3	10.3	5.29		-23.69
288	11		-.3	.3	.09		-.09
289	15		3.7	.3	13.69		1.11
290	12		.7	10.3	.49		7.21
291	9		-2.3	10.3	5.29		-23.69
292	13		1.7	20.3	2.89		34.51
293	11		-.3	20.3	.09		-6.09
294	12		.7	.3	.49		.21
295	13		1.7	.3	2.89		.51

TABLE V

No.	X	Y	X	Y	S _x	S _y	V _x
846	15	Same	3.7	10.3	13.69	Same	38.11
847	9	as in	-8.3	-84.7	3.29	as in	38.11
848	15	Table	7.	80.3	49.	Table	14.81
849	9	111 (p)	-8.3	3.	3.29	111 (p)	49.
850	9		-8.3	-9.7	3.29		38.11
851	7		-4.3	10.3	18.49		-44.89
852	11		-3.	80.3	09.		-8.09
853	7		-4.3	-9.7	18.49		41.71
854	14		8.7	80.3	7.29		84.81
855	18		7.	10.3	49.		7.21
856	15		3.7	80.3	13.69		72.11
857	11		-3.	-39.7	09.		11.91
858	11		-3.	10.3	09.		-3.09
859	14		8.7	80.3	7.29		84.81
860	9		-8.3	10.3	3.29		-83.89
861	--		--	--	--		--
862	11		-3.	3.	09.		09.
863	9		-8.3	-9.7	3.29		38.11
864	10		-1.3	80.3	1.69		-39.89
865	11		-3.	80.3	09.		-8.09
866	9		-8.3	-9.7	3.29		38.11
867	18		7.	3.	49.		81
868	18		7.	-9.7	49.		-8.79
869	18		7.	3.	49.		81
870	15		3.7	-9.7	13.69		-39.89
871	18		7.	3.	49.		81
872	18		7.	3.	49.		81
873	10		-1.3	10.3	1.69		-13.39
874	9		-8.3	3.	3.29		09.
875	10		-1.3	-9.7	1.69		13.81
876	9		-8.3	3.	3.29		09.
877	18		7.	3.	49.		81
878	18		7.	80.3	49.		14.81
879	9		-8.3	10.3	3.29		-83.89
880	10		-1.3	3.	1.69		09.
881	9		-8.3	3.	3.29		09.
882	18		7.	3.	49.		81
883	14		8.7	10.3	7.29		87.81
884	14		8.7	80.3	7.29		84.81
885	10		-1.3	3.	1.69		09.
886	18		7.	3.	49.		81
887	9		-8.3	10.3	3.29		-83.89
888	11		-3.	3.	09.		09.
889	15		3.7	3.	13.69		11.11
890	18		7.	10.3	49.		7.21
891	9		-8.3	10.3	3.29		-83.89
892	13		1.7	80.3	3.99		34.81
893	11		-3.	80.3	09.		-8.09
894	18		7.	3.	49.		81
895	13		1.7	3.	3.89		18.

TABLE V b

No.	X	Y	x	y	x ²	y ²	xy
296	12	Same	.7	20.3	.49	Same	14.21
297	10	as in	-1.3	- 9.7	1.69	as in	12.61
298	12	Table	.7	- 9.7	.49	Table	- 6.79
299	14	III (b)	2.7	10.3	7.29	III (b)	27.81
300	10		-1.3	20.3	1.69		-26.39
301	14		2.7	-24.7	7.29		-66.69
302	14		2.7	10.3	7.29		27.81
303	14		2.7	10.3	7.29		27.81
304	16		4.7	.3	22.09		1.41
305	15		3.7	.3	13.69		1.11
306	12		.7	.3	.49		.21
307	13		1.7	-24.7	2.89		-41.99
308	11		- .3	.3	.09		- .09
309	10		-1.3	- 9.7	1.69		12.61
310	15		3.7	10.3	13.69		38.11
311	11		- .3	- 9.7	.09		2.91
312	11		- .3	.3	.09		- .09
313	11		- .3	- 9.7	.09		2.91
314	12		.7	10.3	.49		7.21
315	9		-2.3	-24.7	5.29		56.81
316	9		-2.3	.3	5.29		- .69
317	9		-2.3	10.3	5.29		-23.69
318	13		1.7	-39.7	2.89		-67.49
319	9		-2.3	-24.7	5.29		56.81
320	12		.7	- 9.7	.49		- 6.79
321	9		-2.3	- 9.7	5.29		22.31
322	9		-2.3	.3	5.29		- .69
323	10		-1.3	.3	1.69		- .39
324	10		-1.3	- 9.7	1.69		12.61
325	10		-1.3	- 9.7	1.69		12.61
326	10		-1.3	-24.7	1.69		32.11
327	11		- .3	-39.7	.09		11.91
328	11		- .3	-39.7	.09		11.91
329	7		-4.3	-39.7	18.49		170.01
330	8		-3.3	-24.7	10.89		81.51
331	--		--	---	---		---
332	9		-2.3	- 9.7	5.29		22.31
333	9		-2.3	-39.7	5.29		91.31
334	12		.7	- 9.7	.49		- 6.79
335	11		- .3	-24.7	.09		7.41
336	12		.7	-24.7	.49		-17.29
337	13		1.7	-39.7	2.89		-67.49
338	10		-1.3	- 9.7	1.69		12.61
339	10		-1.3	-39.7	1.69		51.61
340	9		-2.3	-24.7	5.29		56.81
341	13		1.7	- 9.7	2.89		-16.49
342	15		3.7	-24.7	13.69		-91.39
336	3787	25,095			1,668.64	69,936.33	1,996.54
	11.3						

TABLE V b

No.	X	Y	x	y	S _x	S _y	X ₂
326	12	Same	7	80.3	42	Same	14.51
327	10	as in	-1.3	- 2.7	1.22	as in	12.51
328	12	Table	7	- 2.7	42	Table	- 2.72
329	14	III (d)	2.7	10.3	7.22	III (d)	27.21
300	10		-1.3	80.3	1.22		-22.22
301	14		2.7	-24.7	7.22		-22.22
302	14		2.7	10.3	7.22		27.21
303	14		2.7	10.3	7.22		27.21
304	12		4.7	3	22.02		1.41
305	12		2.7	3	12.22		1.11
306	12		7	3	42		12
307	12		1.7	-24.7	2.22		-41.22
308	11		3	3	02		- 02
309	10		-1.3	- 2.7	1.22		12.21
310	12		2.7	10.3	12.22		32.11
311	11		3	- 2.7	02		2.21
312	11		3	3	02		- 02
313	11		3	- 2.7	02		2.21
314	12		7	10.3	42		7.21
315	2		-2.3	-24.7	2.22		22.21
316	2		-2.3	3	2.22		- 22
317	2		-2.3	10.3	2.22		-22.22
318	12		1.7	-22.7	2.22		-27.22
319	2		-2.3	-24.7	2.22		22.21
320	12		7	- 2.7	42		- 2.72
321	2		-2.3	- 2.7	2.22		22.21
322	2		-2.3	3	2.22		- 22
323	10		-1.3	3	1.22		12.21
324	10		-1.3	- 2.7	1.22		12.21
325	10		-1.3	- 2.7	1.22		12.21
326	10		-1.3	-24.7	1.22		12.21
327	11		3	-22.7	02		11.21
328	11		3	-22.7	02		11.21
329	7		-4.3	-22.7	12.22		170.01
330	2		-2.3	-24.7	10.22		21.21
331	--		--	--	--		--
332	2		-2.3	- 2.7	2.22		22.21
333	2		-2.3	-22.7	2.22		21.21
334	12		7	- 2.7	42		- 2.72
335	11		3	-24.7	02		7.21
336	12		7	-24.7	42		-17.22
337	12		1.7	-22.7	2.22		-27.22
338	10		-1.3	- 2.7	1.22		12.21
339	10		-1.3	-22.7	1.22		21.21
340	2		-2.3	-24.7	2.22		22.21
341	12		1.7	- 2.7	222		-12.22
342	12		2.7	-24.7	12.22		-27.22
322	272	22,022			1,022.22	22,222.22	1,222.22
11.2							

TABLE V b (C)

$$\text{Correlating, } r = \frac{1,996.54}{\sqrt{1668.64} \times \sqrt{69,936.33}}$$

$$r = \frac{1,996.54}{40.85 \times 264.45} = \frac{1,996.54}{10,802.78} = 0.19$$

$$\text{P.E.} = \frac{.6745 \times .964}{18.33} = .0354$$

TABLE V

$$\begin{aligned} \text{Correlation, } r &= \frac{1,998.54}{\sqrt{1988.64 \times 10,802.78}} \\ r &= \frac{1,998.54}{40.82 \times 10,802.78} = 0.19 \\ \text{P.E.} &= \frac{.6745 \times .964}{18.73} = .0354 \end{aligned}$$

TABLE V c (1936)

Correlation Between the Arithmetic Section of
Army Alpha and Algebra Final Grades

No.	X	Y	x	y	x^2	y^2	xy
36-1	11	Same as Table III c	-1	17.7	1	Same as Table III c	- 17.7
2	10		-2	17.7	4		- 35.4
3	12		0	- 2.3	0		0
4	9		-3	-12.3	9		36.9
5	11		-1	7.7	1		7.7
6	14		2	7.7	4		15.4
7	14		2	- 2.3	4		- 4.6
8	11		-1	7.7	1		- 7.7
9	11		-1	-27.3	1		27.3
10	12		0	7.7	0		0
11	15		3	7.7	9		23.1
12	12		0	7.7	0		0
13	11		-1	7.7	1		- 7.7
14	13		1	- 2.3	1		- 2.3
15	--		-	--	-		--
16	16		4	-12.3	16		- 49.2
17	13		1	7.7	1		7.7
18	13		1	7.7	1		7.7
19	15		3	17.7	9		53.1
20	10		-2	-12.3	4		24.6
21	10		-2	7.7	4		- 15.4
22	13		1	7.7	1		7.7
23	12		0	- 2.3	0		0
24	12		0	17.7	0		0
25	14		2	7.7	4		15.4
26	18		6	17.7	36		106.2
27	14		2	7.7	4		15.4
28	11		-1	- 2.3	1		2.3
29	13		1	7.7	1		7.7
30	9		-3	-27.3	9		81.9
31	11		-1	17.7	1		- 17.7
32	10		-2	-12.3	4		24.6
33	15		3	- 2.3	9		- 6.9
34	13		1	- 2.3	1		- 2.3
35	12		0	-12.3	0		0
36	9		-3	7.7	9		- 23.1
37	10		-2	- 2.3	4		4.6
38	15		3	-12.3	9		- 26.9
39	11		-1	-27.3	1		27.3
40	10		-2	- 2.3	4		4.6
41	13		1	-12.3	1		- 12.3
42	12		0	7.7	0		0
43	13		1	7.7	1		7.7
44	13		1	7.7	1		7.7
45	15		3	- 2.3	9		- 6.9

TABLE V (1936)

Correlation Between the Arithmetic Section of
Army Alpha and Algebra Final Grades

No.	X	Y	x	y	X	Y	xy
26-1	11	Same as Table 11-1	-1	17.7	1	Same as Table 11-1	-17.7
2	10		-2	17.7	4		-35.4
3	12		0	-2.3	0		0
4	9		-3	-12.3	9		-36.9
5	11		-1	7.7	1		7.7
6	14		3	7.7	4		30.8
7	14		3	-2.3	4		-8.8
8	11		-1	7.7	1		7.7
9	11		-1	-27.3	1		-27.3
10	12		0	7.7	0		0
11	12		3	7.7	9		23.1
12	12		0	7.7	0		0
13	11		-1	7.7	1		-7.7
14	13		1	-2.3	1		-2.3
15	--		--	--	--		--
16	12		4	-12.3	16		-49.8
17	13		1	7.7	1		7.7
18	13		1	7.7	1		7.7
19	12		3	17.7	9		53.1
20	10		-2	-12.3	4		-24.8
21	10		-2	7.7	4		-15.4
22	13		1	7.7	1		7.7
23	12		0	-2.3	0		0
24	12		0	17.7	0		0
25	14		2	7.7	4		15.4
26	18		6	17.7	36		106.2
27	14		2	7.7	4		15.4
28	11		-1	-2.3	1		-2.3
29	13		1	7.7	1		7.7
30	9		-3	-27.3	9		-81.9
31	11		-1	17.7	1		-17.7
32	10		-2	-12.3	4		-24.8
33	12		3	-2.3	9		-20.7
34	13		1	-2.3	1		-2.3
35	12		0	-12.3	0		0
36	9		-3	7.7	9		-23.1
37	10		-2	-2.3	4		-8.8
38	12		3	-12.3	9		-36.9
39	11		-1	-27.3	1		-27.3
40	10		-2	-2.3	4		-8.8
41	13		1	-12.3	1		-12.3
42	12		0	7.7	0		0
43	13		1	7.7	1		7.7
44	13		1	7.7	1		7.7
45	12		3	-2.3	9		-20.7

TABLE V c (1936)

No.	X	Y	x	y	x ²	y ²	xy
46	10	Same as Table	-2	7.7	4	Same as Table	- 15.4
47	11	III c	-1	17.7	1	III c	- 17.7
48	13		1	- 2.3	1		- 2.3
49	15		3	- 2.3	9		- 6.9
50	14		2	7.7	4		15.4
51	11		-1	- 2.3	1		2.3
52	9		-3	7.7	9		- 23.1
53	13		1	7.7	1		7.7
54	11		-1	- 2.3	1		2.3
55	11		-1	7.7	1		- 7.7
56	15		3	-12.3	9		- 36.9
57	13		1	- 2.3	1		- 2.3
58	12		0	- 2.3	0		0
59	--		-	----	-		----
60	14		2	7.7	4		15.4
61	12		0	-12.3	0		0
62	12		0	7.7	0		0
63	15		3	7.7	9		23.1
64	8		-4	7.7	16		- 30.8
65	13		1	-42.3	1		- 42.3
66	15		3	7.7	9		23.1
67	10		-2	7.7	4		- 15.4
68	17		5	7.7	25		38.5
69	13		1	-12.3	1		- 12.3
70	12		0	- 2.3	0		0
71	13		1	7.7	1		7.7
72	15		3	7.7	9		23.1
73	13		1	7.7	1		7.7
74	14		2	17.7	4		35.4
75	13		1	7.7	1		7.7
76	11		-1	- 2.3	1		2.3
77	15		3	- 2.3	9		- 6.9
78	15		3	17.7	9		53.1
79	12		0	- 2.3	0		0
80	13		1	-12.3	1		- 12.3
81	13		1	- 2.3	1		- 2.3
82	9		-3	- 2.3	9		6.9
83	12		0	7.7	0		0
84	13		1	7.7	1		7.7
85	13		1	- 2.3	1		- 2.3
86	10		-2	- 2.3	4		4.6
87	12		0	7.7	0		0
88	12		0	- 2.3	0		0
89	14		2	-12.3	4		-24.6
90	17		5	7.7	25		38.5
91	11		-1	-12.3	1		12.3
92	13		1	-27.3	1		- 27.3
93	18		6	7.7	36		46.2

TABLE V a (1936)

No.	X	Y	X	Y	X	Y
46	10	Same as Table III c	-8	7.7	4	Same as Table III c
47	11		-1	17.7	1	
48	12		1	-8.3	1	
49	13		2	-8.3	2	
50	14		3	7.7	3	
51	11		-1	-8.3	1	
52	9		-3	7.7	2	
53	13		1	7.7	1	
54	11		-1	-8.3	1	
55	11		-1	7.7	1	
56	13		2	-12.3	2	
57	13		1	-8.3	1	
58	13		0	-8.3	0	
59	--		--	--	--	
60	14		2	7.7	4	
61	12		0	-12.3	0	
62	12		0	7.7	0	
63	12		3	7.7	2	
64	8		-4	7.7	12	
65	13		1	-12.3	1	
66	12		2	7.7	2	
67	10		-2	7.7	4	
68	17		3	7.7	23	
69	13		1	-12.3	1	
70	12		0	-8.3	0	
71	12		1	7.7	1	
72	12		3	7.7	2	
73	13		1	7.7	1	
74	14		2	17.7	2	
75	13		1	7.7	1	
76	11		-1	-8.3	1	
77	12		3	-8.3	2	
78	12		3	17.7	2	
79	12		0	-8.3	0	
80	13		1	-12.3	1	
81	13		1	-8.3	1	
82	9		-3	-8.3	2	
83	12		0	7.7	0	
84	13		1	7.7	1	
85	13		1	-8.3	1	
86	10		-2	-8.3	4	
87	12		0	7.7	0	
88	13		0	-8.3	0	
89	14		2	-12.3	4	
90	17		3	7.7	23	
91	11		-1	-12.3	1	
92	12		1	-12.3	1	
93	13		2	7.7	2	

TABLE V c (1936)

No.	X	Y	x	y	x ²	y ²	xy
94	14	Same as Table	2	7.7	4	Same as Table	15.4
95	10	III c	-2	17.7	4	III c	- 35.4
96	10		-2	-12.3	4		24.6
97	12		0	7.7	0		0
98	9		-3	7.7	9		- 23.1
99	11		-1	7.7	1		- 7.7
100	11		-1	-12.3	1		12.3
101	13		1	-12.3	1		- 12.3
102	9		-3	-12.3	9		36.9
103	13		1	7.7	1		7.7
104	10		-2	-12.3	4		24.6
105	11		-1	-12.3	1		12.3
106	13		1	7.7	1		7.7
107	13		1	7.7	1		7.7
108	10		-2	- 2.3	4		4.6
109	11		-1	7.7	1		- 7.7
110	11		-1	- 2.3	1		2.3
111	12		0	- 2.3	0		0
112	12		0	- 2.3	0		0
113	12		0	7.7	0		0
114	10		-2	17.7	4		- 35.4
115	17		5	- 2.3	25		- 11.5
116	13		1	7.7	1		7.7
117	13		1	-12.3	1		- 12.3
118	8		-4	-12.3	16		49.2
119	12		0	-12.3	0		0
120	3		-9	- 2.3	81		20.7
121	13		1	17.7	1		17.7
122	16		4	- 2.3	16		- 9.2
123	11		-1	- 2.3	1		2.3
124	9		-3	-12.3	9		36.9
125	12		0	- 2.3	0		0
126	15		3	7.7	9		23.1
127	11		-1	- 2.3	1		2.3
128	10		-2	- 2.3	4		4.6
129	9		-3	-12.3	9		36.9
130	--		-	----	-		----
131	14		2	7.7	4		15.4
132	--		-	----	-		----
133	9		-3	- 2.3	9		6.9
134	--		-	----	-		----
135	9		-3	- 2.3	9		6.9
136	11		-1	-12.3	1		12.3
137	12		0	7.7	0		0
138	15		3	-12.3	9		- 36.9
139	9		-3	7.7	9		- 23.1
140	11		-1	17.7	1		- 17.7
141	12		0	17.7	0		0

TABLE V (1956)

No.	X	f	x	y	Σx	Σy	Σxy
94	14	Game as Table	8	7.7	4	Game as Table	15.4
95	10	III c	-2	17.7	4	III c	-35.4
96	10		-2	-12.3	4		24.6
97	12		0	7.7	0		0
98	9		-3	7.7	9		-23.1
99	11		-1	7.7	1		-7.7
100	11		-1	-12.3	1		-12.3
101	12		1	-12.3	1		-12.3
102	9		-3	-12.3	9		-36.9
103	13		1	7.7	1		7.7
104	10		-2	-12.3	4		24.6
105	11		-1	-12.3	1		-12.3
106	13		1	7.7	1		7.7
107	13		1	7.7	1		7.7
108	10		-2	-2.3	4		-4.6
109	11		-1	7.7	1		-7.7
110	11		-1	-2.3	1		-2.3
111	12		0	-2.3	0		0
112	12		0	-2.3	0		0
113	12		0	7.7	0		0
114	10		-2	17.7	4		-35.4
115	17		9	-2.3	22		-11.2
116	13		1	7.7	1		7.7
117	12		1	-12.3	1		-12.3
118	8		-4	-12.3	16		-49.8
119	12		0	-12.3	0		0
120	3		-9	-2.3	21		-20.7
121	13		1	17.7	1		17.7
122	16		4	-2.3	16		-9.2
123	11		-1	-2.3	1		-2.3
124	9		-3	-12.3	9		-36.9
125	12		0	-2.3	0		0
126	12		3	7.7	9		23.1
127	11		-1	-2.3	1		-2.3
128	10		-2	-2.3	4		-4.6
129	9		-3	-12.3	9		-36.9
130	--		--	--	--		--
131	14		2	7.7	4		15.4
132	--		--	--	--		--
133	9		-3	-2.3	9		-9.2
134	--		--	--	--		--
135	9		-3	-2.3	9		-9.2
136	11		-1	-12.3	1		-12.3
137	12		0	7.7	0		0
138	12		3	-12.3	9		-36.9
139	9		-3	7.7	9		-23.1
140	11		-1	17.7	1		-17.7
141	12		0	17.7	0		0

TABLE V c (1936)

No.	X	Y	x	y	x ²	y ²	xy
142	11	Same as Table III c	-1	-12.3	1	Same as Table III c	12.3
143	12		0	17.7	0		0
144	9		-3	- 2.3	9		6.9
145	13		1	17.7	1		17.7
146	12		0	- 2.3	0		0
147	9		-3	- 2.3	9		6.9
148	11		-1	- 2.3	1		2.3
149	11		-1	7.7	1		- 7.7
150	14		2	-12.3	4		- 24.6
151	12		0	7.7	0		0
152	15		3	17.7	9		53.1
153	11		-1	7.7	1		- 7.7
154	10		-2	-12.3	4		24.6
155	12		0	- 2.3	0		0
156	13		1	-12.3	1		- 12.3
157	12		0	7.7	0		0
158	6		-6	-12.3	36		73.8
159	10		-2	2.3	4		- 4.6
160	11		-1	7.7	1		7.7
161	11		-1	-27.3	1		27.3
162	9		-3	- 2.3	9		6.9
163	11		-1	- 2.3	1		2.3
164	16		4	-12.3	16		- 49.2
165	13		1	7.7	1		7.7
166	11		-1	7.7	1		- 7.7
167	10		-2	- 2.3	4		4.6
168	18		6	17.7	36		106.2
169	17		5	17.7	25		88.5
170	11		-1	- 2.3	1		2.3
171	14		2	-12.3	4		- 24.6
172	11		-1	7.7	1		- 7.7
173	11		-1	- 2.3	1		2.3
174	10		-2	17.7	4		- 35.4
175	15		3	17.7	9		53.1
176	14		2	- 2.3	4		- 4.6
177	13		1	- 2.3	1		- 2.3
178	11		-1	17.7	1		- 17.7
179	12		0	-12.3	0		0
180	13		1	7.7	1		7.7
181	10		-2	- 2.3	4		4.6
182	12		0	7.7	0		0
183	12		0	- 2.3	0		0
184	15		3	- 2.3	9		- 6.9
185	16		4	7.7	16		30.8
186	13		1	7.7	1		7.7
187	13		1	7.7	1		7.7
188	11		-1	- 2.3	1		2.3
189	7		-5	- 2.3	25		11.5

TABLE V c (1956)

No.	X	Y	X	Y	X	Y	X _Y
142	11	Same as Table III c	-1	-12.3	1	Same as Table III c	12.3
143	12	Table III c	0	17.7	0		0
144	9		-3	-2.3	9		2.3
145	13		1	17.7	1		17.7
146	12		0	-2.3	0		0
147	9		-3	-2.3	9		2.3
148	11		-1	-2.3	1		2.3
149	11		-1	7.7	1		7.7
150	14		2	-12.3	4		-24.6
151	12		0	7.7	0		0
152	12		2	17.7	9		32.1
153	11		-1	7.7	1		7.7
154	10		-3	-12.3	4		24.6
155	12		0	-2.3	0		0
156	13		1	-12.3	1		-12.3
157	12		0	7.7	0		0
158	8		-2	-12.3	22		22.8
159	10		-3	-2.3	4		4.6
160	11		-1	7.7	1		7.7
161	11		-1	-27.3	1		27.3
162	9		-3	-2.3	9		2.3
163	11		-1	-2.3	1		2.3
164	12		4	-12.3	16		-48.8
165	13		1	7.7	1		7.7
166	11		-1	7.7	1		7.7
167	10		-3	-2.3	4		4.6
168	12		2	17.7	22		22.8
169	17		2	17.7	22		22.8
170	11		-1	-2.3	1		2.3
171	14		2	-12.3	4		24.6
172	11		-1	7.7	1		7.7
173	11		-1	-2.3	1		2.3
174	10		-3	17.7	4		22.8
175	12		2	17.7	9		32.1
176	14		2	-2.3	4		4.6
177	12		1	-2.3	1		2.3
178	11		-1	17.7	1		17.7
179	12		0	-12.3	0		0
180	12		1	7.7	1		7.7
181	10		-3	-2.3	4		4.6
182	12		0	7.7	0		0
183	12		0	-2.3	0		0
184	12		2	-2.3	9		2.3
185	12		4	7.7	16		30.8
186	13		1	7.7	1		7.7
187	13		1	7.7	1		7.7
188	11		-1	-2.3	1		2.3
189	7		-2	-2.3	22		11.2

TABLE V c (1936)

No.	X	Y	x	y	x^2	y^2	xy
190	13	Same as Table	1	- 2.3	1	Same as Table	- 2.3
191	11	III c	-1	7.7	1	III c	- 7.7
192	13		1	7.7	1		7.7
193	18		6	7.7	36		46.2
194	9		-3	- 2.3	9		6.9
195	11		-1	-12.3	1		12.3
196	10		-2	-12.3	4		24.6
197	11		-1	17.7	1		- 17.7
198	13		1	17.7	1		17.7
199	15		3	7.7	9		23.1
200	9		-3	-27.3	9		81.9
201	12		0	- 2.3	0		0
202	13		1	- 2.3	1		- 2.3
203	12		0	7.7	0		0
204	12		0	7.7	0		0
205	13		1	7.7	1		7.7
206	12		0	7.7	0		0
207	11		-1	7.7	1		- 7.7
208	12		0	17.7	0		0
209	15		3	- 2.3	9		- 6.9
210	13		1	17.7	1		17.7
211	13		1	- 2.3	1		- 2.3
212	13		1	- 2.3	1		- 2.3
213	15		3	17.7	9		53.1
214	12		0	- 2.3	0		0
215	13		1	- 2.3	1		- 2.3
216	15		3	- 7.7	9		23.1
217	13		1	- 2.3	1		- 2.3
218	17		5	7.7	25		38.5
219	11		-1	-12.3	1		12.3
220	15		3	7.7	9		23.1
221	10		-2	- 2.3	4		4.6
222	6		-6	-12.3	36		73.8
223	13		1	17.7	1		17.7
224	14		2	- 2.3	4		- 4.6
225	12		0	-12.3	0		0
226	8		-4	7.7	16		- 30.8
227	12		0	-12.3	0		0
228	14		2	7.7	4		15.4
229	10		-2	- 2.3	4		4.6
230	14		2	- 2.3	4		- 4.6
231	8		-4	7.7	16		- 30.8
232	12		0	7.7	0		0
233	18		6	7.7	36		46.2
234	11		-1	7.7	1		- 7.7
235	11		-1	- 2.3	1		2.3
236	11		-1	7.7	1		- 7.7
237	13		1	7.7	1		7.7

TABLE V c (1936)

No.	X	Y	x	y	x	y	xy
190	13	Same as Table III c	1	- 2.3	1	Same as Table III c	- 2.3
191	11		-1	7.7	1		- 7.7
192	13		1	7.7	1		7.7
193	18		6	7.7	36		46.2
194	9		-3	- 8.3	9		- 24.3
195	11		-1	-18.3	1		18.3
196	10		-3	-18.3	4		54.9
197	11		-1	17.7	1		- 17.7
198	13		1	17.7	1		17.7
199	18		3	7.7	9		23.1
200	9		-3	-27.3	9		- 81.9
201	18		0	- 8.3	0		0
202	13		1	- 8.3	1		- 8.3
203	18		0	7.7	0		0
204	18		0	7.7	0		0
205	13		1	7.7	1		7.7
206	18		0	7.7	0		0
207	11		-1	7.7	1		- 7.7
208	18		0	17.7	0		0
209	18		3	- 8.3	9		- 24.3
210	13		1	17.7	1		17.7
211	18		1	- 8.3	1		- 8.3
212	13		1	- 8.3	1		- 8.3
213	18		3	17.7	9		53.1
214	18		0	- 8.3	0		0
215	13		1	- 8.3	1		- 8.3
216	18		3	- 7.7	9		- 23.1
217	13		1	- 8.3	1		- 8.3
218	17		6	7.7	36		46.2
219	11		-1	-18.3	1		18.3
220	18		3	7.7	9		23.1
221	10		-3	- 8.3	4		- 33.2
222	6		-6	-18.3	36		133.8
223	13		1	17.7	1		17.7
224	14		2	- 8.3	4		- 16.6
225	18		0	-18.3	0		0
226	8		-4	7.7	16		- 30.8
227	18		0	-18.3	0		0
228	14		2	7.7	4		15.4
229	10		-3	- 8.3	4		- 24.9
230	14		2	- 8.3	4		- 16.6
231	8		-4	7.7	16		- 30.8
232	18		0	7.7	0		0
233	18		6	7.7	36		46.2
234	11		-1	7.7	1		- 7.7
235	11		-1	- 8.3	1		8.3
236	11		-1	7.7	1		- 7.7
237	13		1	7.7	1		7.7

TABLE V c (1936)

No.	X	Y	x	y	x ²	y ²	xy
238	16	Same as Table	4	7.7	16	Same as Table	30.8
239	9	III c	-3	7.7	9	III c	- 23.1
240	11		-1	- 2.3	1		2.3
241	12		0	7.7	0		0
242	13		1	-12.3	1		- 12.3
243	16		4	17.7	16		70.8
244	12		0	17.7	0		0
245	16		4	17.7	16		70.8
246	15		3	- 2.3	9		- 6.9
247	15		3	7.7	9		23.1
248	10		-2	7.7	4		15.4
249	12		0	7.7	0		0
250	15		3	- 2.3	9		- 6.9
251	11		-1	7.7	1		- 7.7
252	16		4	- 2.3	16		- 9.2
253	13		1	17.7	1		17.7
254	12		0	7.7	0		0
255	10		-2	7.7	4		- 15.4
256	10		-2	- 2.3	4		4.6
257	11		-1	7.7	0		- 7.7
258	10		-2	-42.3	4		84.6
259	11		-1	- 2.3	1		2.3
260	11		-1	- 2.3	1		2.3
261	7		-5	- 2.3	25		11.5
262	10		-2	-27.3	4		54.6
263	13		1	-27.3	1		- 27.3
264	10		-2	-42.3	4		84.6
265	12		0	-27.3	0		0
266	10		-2	-12.3	4		24.6
267	8		-4	-27.3	16		109.2
268	11		-1	- 2.3	1		2.3
269	13		1	-12.3	1		- 12.3
270	8		-4	-27.3	16		109.2
271	10		-2	-12.3	4		24.6
272	11		-1	-12.3	1		12.3
273	8		-4	-42.3	16		169.2
274	11		-1	-27.3	1		27.3
275	12		0	7.7	0		0
276	9		-3	- 2.3	9		6.9
277	8		-4	-12.3	16		49.2
278	11		-1	- 2.3	1		2.3
279	12		0	-42.3	0		0
280	10		-2	-12.3	4		24.6
281	13		1	-12.3	1		- 12.3
276	3322				1,457	41,286.04	2,218.4
	12.0						

TABLE V c (1936)

No.	X	Y	x	y	X	Y	xy
238	16	Same as Table III c	4	7.7	16	Same as Table III c	50.8
239	9		-3	7.7	9		-23.1
240	11		-1	8.3	11		8.3
241	16		0	7.7	16		0
242	18		1	-18.3	18		-18.3
243	21		4	17.7	16		70.8
244	18		0	17.7	0		0
245	16		4	17.7	16		70.8
246	18		3	8.3	9		-8.3
247	18		8	7.7	9		23.1
248	10		-8	7.7	4		-18.3
249	18		0	7.7	0		0
250	16		3	8.3	9		-8.3
251	11		-1	7.7	1		-7.7
252	16		4	8.3	16		33.2
253	13		1	17.7	1		17.7
254	18		0	7.7	0		0
255	10		-3	7.7	4		-12.4
256	10		-8	8.3	4		4.4
257	11		-1	7.7	0		-7.7
258	10		-8	8.3	4		8.4
259	11		-1	8.3	1		8.3
260	11		-1	8.3	1		8.3
261	7		-3	8.3	25		11.3
262	10		-8	8.3	4		8.3
263	13		1	8.3	1		-27.3
264	10		-8	8.3	4		8.4
265	18		0	8.3	0		0
266	10		-3	8.3	4		8.4
267	8		-4	8.3	16		109.3
268	11		-1	8.3	1		8.3
269	13		1	8.3	1		-18.3
270	8		-4	8.3	16		109.3
271	10		-3	8.3	4		8.4
272	11		-1	8.3	1		18.3
273	8		-4	8.3	16		189.3
274	11		-1	8.3	1		8.3
275	18		0	7.7	0		0
276	9		-3	8.3	9		8.3
277	8		-4	8.3	16		48.3
278	11		-1	8.3	1		8.3
279	18		0	8.3	0		0
280	10		-3	8.3	4		8.4
281	13		1	8.3	1		-18.3
282	3325				1,437		41,886.04
283	18.0						8,818.4

TABLE v c (1936)

$$\text{Correlating } r = \frac{2,218.4}{\sqrt{1,457} \times \sqrt{41,286.04}} = \frac{2,218.4}{38.17 \times 203.2}$$

$$= \frac{2,218.4}{7762.24} = .286$$

$$\text{Probable Error} = \frac{.6745 \times (1 - r^2)}{\sqrt{N}} = \frac{.6745 \times .918}{16.6} = .0372$$

TABLE V c (1936)

$$\text{Correlation } r = \frac{S_{xy}}{\sqrt{S_{xx} S_{yy}}} = \frac{21,437 \times 10,388.04}{\sqrt{2,308 \times 202.2}} = \frac{221,818.4}{21,437} = 10.388$$

$$r = \frac{S_{xy}}{\sqrt{S_{xx} S_{yy}}} = \frac{221,818.4}{21,437} = 10.388$$

$$\text{Probable Error} = \frac{.6745 \times (1 - r^2)^{1/2}}{\sqrt{n}} = \frac{.6745 \times .918}{\sqrt{18.6}} = .0375$$

TABLE V d (1935)

Correlation of Army Alpha Arithmetic Section and
Algebra Final Grades

No.	X	Y	x	y	x^2	y^2	xy
35-1	10	Same as in-	1.9	-13	3.61	Same as	24.7
2	14	Table III	2.1	7	4.41	in Table	14.7
3	9	c	- 2.9	- 3	8.41	III c	8.7
4	10		- 1.9	- 3	3.61		5.7
5	11		- .9	7	.81		- 6.3
6	17		5.1	-13	26.01		- 66.3
7	10		- 1.9	-13	3.61		24.7
8	15		3.1	7	9.61		21.7
9	10		- 1.9	17	3.61		- 32.3
10	14		2.1	7	4.41		14.7
11	12		.1	-13	.01		- 1.3
12	11		- .9	7	.81		- 6.3
13	12		.1	7	.01		.7
14	9		- 2.9	7	8.41		- 20.6
15	11		- .9	- 3	.81		2.7
16	13		1.1	- 3	1.21		- 3.3
17	13		1.1	7	1.21		7.7
18	11		- .9	17	.81		- 15.3
19	11		- .9	7	.81		- 6.3
20	12		.1	- 3	.01		- .3
21	12		.1	17	.01		1.7
22	11		- .9	- 3	.81		2.7
23	11		- .9	7	.81		- 6.3
24	14		2.1	-28	4.41		- 58.8
25	12		.1	- 3	.01		- .3
26	17		5.1	17	26.01		86.7
27	13		1.1	17	1.21		18.7
28	10		- 1.9	- 3	3.61		5.7
29	11		- .9	7	.81		- 6.3
30	12		.1	- 3	.01		- .3
31	11		- .9	7	.81		- 6.3
32	11		- .9	- 3	.81		2.7
33	12		.1	7	.01		1.7
34	14		2.1	7	4.41		14.7
35	12		.1	7	.01		.7
36	11		- .9	17	.81		- 15.3
37	11		- .9	-13	.81		11.7
38	10		- 1.9	7	3.61		- 13.3
39	10		- 1.9	17	3.61		- 32.3
40	11		- .9	- 3	.81		2.7
41	12		.1	-13	.01		- 1.3
42	16		4.1	-13	16.81		- 53.3
43	11		- .9	-13	.81		11.7
44	11		- .9	-13	.81		11.7
45	11		- .9	17	.81		- 15.3
46	11		- .9	-28	.81		25.2

TABLE V (1930)

Correlation of Army Alpha Arithmetic Section and
Alpha Final Grades

No.	X	Y	X	Y	X	Y	X	Y
35-1	10	Same as 10-1	1.9	-13	3.61	Same as	84.7	
2	14	Table III	3.1	7	4.41	in Table	14.7	
3	9	c	-3.9	-3	6.41	III c	6.7	
4	13		-1.9	-3	3.61		5.7	
5	11		.9	7	.81		6.3	-
6	17		3.1	-13	36.01		66.3	-
7	10		-1.9	-13	3.61		84.7	
8	13		3.1	7	9.61		81.7	
9	10		-1.9	17	3.61		32.3	-
10	14		3.1	7	4.41		14.7	
11	12		.1	-13	.01		1.3	-
12	11		.9	7	.81		6.3	-
13	12		1.	7	.01		7	
14	9		-3.9	7	6.41		30.3	-
15	11		.9	-3	.81		2.7	
16	13		1.1	-3	1.21		3.3	-
17	13		1.1	7	1.21		7.7	
18	11		.9	17	.81		13.3	-
19	11		.9	7	.81		6.3	-
20	12		1.	-3	.01		3	-
21	12		1.	17	.01		1.7	
22	11		.9	-3	.81		4.7	
23	11		.9	7	.81		6.3	-
24	14		3.1	-33	4.41		33.3	-
25	12		1.	-3	.01		3	-
26	17		3.1	17	36.01		84.7	
27	13		1.1	17	1.21		18.7	
28	10		-1.9	-3	3.61		5.7	
29	11		.9	7	.81		6.3	-
30	12		1.	-3	.01		3	-
31	11		.9	7	.81		6.3	-
32	11		.9	-3	.81		2.7	
33	12		1.	7	.01		7	
34	14		3.1	7	4.41		14.7	
35	12		1.	7	.01		7	
36	11		.9	17	.81		13.3	-
37	11		.9	-13	.81		11.7	
38	10		-1.9	7	3.61		13.3	-
39	10		-1.9	17	3.61		33.3	-
40	11		.9	-3	.81		2.7	
41	12		1.	-13	.01		1.3	-
42	12		1.	-13	16.81		33.3	-
43	11		.9	-13	.81		11.7	
44	11		.9	-13	.81		11.7	
45	11		.9	17	.81		13.3	-
46	11		.9	-33	.81		33.3	-

TABLE V & (1935)

No.	X	Y	x	y	x^2	y^2	xy
47	13	Same as	1.1	7	1.21	Same as	7.7
48	16	in Table	4.1	17	16.81	in Table	69.7
49	16	III c	4.1	- 3	16.81	III c	-12.3
50	10		- 1.9	7	3.61		-13.3
51	10		- 1.9	7	3.61		-13.3
52	13		1.1	-13	1.21		-14.3
53	14		2.1	17	4.41		35.7
54	13		1.1	-13	1.21		-14.3
55	12		.1	7	.01		.7
56	11		- .9	17	.81		-15.3
57	11		- .9	7	.81		- 6.3
58	12		.1	- 3	.01		- .3
59	10		- 1.9	-13	3.61		24.7
60	13		1.1	- 3	1.21		- 3.3
61	11		- .9	-28	.81		25.2
62	15		3.1	7	9.61		21.7
63	11		- .9	-13	.81		11.7
64	8		- 3.9	7	15.21		-27.3
65	13		1.1	-28	1.21		-30.8
66	11		- .9	7	.81		- 6.3
67	10		- 1.9	- 3	3.61		5.7
68	12		.1	7	.01		.7
69	12		.1	-13	.01		- 1.3
70	11		- .9	- 3	.81		2.7
71	16		4.1	- 3	16.81		-12.3
72	13		1.1	- 3	1.21		- 3.3
73	12		.1	7	.01		.7
74	12		.1	7	.01		.7
75	15		3.1	- 3	9.61		- 9.3
76	10		- 1.9	- 3	3.61		5.7
77	11		- .9	7	.81		- 6.3
78	14		2.1	- 3	4.41		- 6.3
79	14		2.1	- 3	4.41		- 6.3
80	9		- 2.9	- 3	8.41		8.7
81	11		- .9	-28	.81		25.2
82	12		.1	7	.01		.7
83	11		- .9	17	.81		-15.3
84	10		- 1.9	7	3.61		-13.3
85	10		- 1.9	7	3.61		-13.3
86	11		- .9	17	.81		-15.3
87	14		2.1	-28	4.41		-58.8
88	11		- .9	17	.81		-15.3
89	--		----	----	----		-----
90	7		- 4.9	-13	24.01		63.7
91	13		1.1	-13	1.21		-14.3
92	14		2.1	- 3	4.41		- 6.3
93	11		- .9	-13	.81		11.7
94	12		.1	7	.01		.7
95	10		- 1.9	- 3	3.61		5.7

TABLE V (1935)

No.	X	Y	X	Y	X	Y	X	Y
47	13	Some as	1.1	7	1.31	Some as	7.7	
48	16	in Table	1.1	17	1.31	in Table	7.7	
49	16	ill c	1.1	5 -	1.31	ill c	1.31 -	
50	10	-	1.1	7	1.31	-	1.31 -	
51	10	-	1.1	7	1.31	-	1.31 -	
52	13	-	1.1	15 -	1.31	-	1.31 -	
53	14	-	1.1	17	1.31	-	1.31 -	
54	13	-	1.1	15 -	1.31	-	1.31 -	
55	13	-	1.1	7	1.31	-	1.31 -	
56	11	-	1.1	17	1.31	-	1.31 -	
57	11	-	1.1	7	1.31	-	1.31 -	
58	12	-	1.1	5 -	1.31	-	1.31 -	
59	10	-	1.1	15 -	1.31	-	1.31 -	
60	13	-	1.1	5 -	1.31	-	1.31 -	
61	11	-	1.1	15 -	1.31	-	1.31 -	
62	12	-	1.1	7	1.31	-	1.31 -	
63	11	-	1.1	15 -	1.31	-	1.31 -	
64	8	-	1.1	7	1.31	-	1.31 -	
65	13	-	1.1	15 -	1.31	-	1.31 -	
66	11	-	1.1	7	1.31	-	1.31 -	
67	10	-	1.1	5 -	1.31	-	1.31 -	
68	12	-	1.1	7	1.31	-	1.31 -	
69	12	-	1.1	15 -	1.31	-	1.31 -	
70	11	-	1.1	5 -	1.31	-	1.31 -	
71	16	-	1.1	5 -	1.31	-	1.31 -	
72	13	-	1.1	5 -	1.31	-	1.31 -	
73	13	-	1.1	7	1.31	-	1.31 -	
74	12	-	1.1	7	1.31	-	1.31 -	
75	12	-	1.1	5 -	1.31	-	1.31 -	
76	10	-	1.1	5 -	1.31	-	1.31 -	
77	11	-	1.1	7	1.31	-	1.31 -	
78	14	-	1.1	5 -	1.31	-	1.31 -	
79	14	-	1.1	5 -	1.31	-	1.31 -	
80	9	-	1.1	5 -	1.31	-	1.31 -	
81	11	-	1.1	15 -	1.31	-	1.31 -	
82	12	-	1.1	7	1.31	-	1.31 -	
83	11	-	1.1	17	1.31	-	1.31 -	
84	10	-	1.1	7	1.31	-	1.31 -	
85	10	-	1.1	7	1.31	-	1.31 -	
86	11	-	1.1	17	1.31	-	1.31 -	
87	14	-	1.1	15 -	1.31	-	1.31 -	
88	11	-	1.1	17	1.31	-	1.31 -	
89	--	--	--	--	--	--	--	
90	7	-	1.1	15 -	1.31	-	1.31 -	
91	12	-	1.1	15 -	1.31	-	1.31 -	
92	14	-	1.1	5 -	1.31	-	1.31 -	
93	11	-	1.1	15 -	1.31	-	1.31 -	
94	12	-	1.1	7	1.31	-	1.31 -	
95	10	-	1.1	5 -	1.31	-	1.31 -	

TABLE V d (1935)

No.	X	Y	x	y	x ²	y ²	xy
96	13	Same as in	1.1	- 3	1.21	Same as in	- 3.3
97	11	Table III c	- .9	-13	.81	Table III c	11.7
98	13		1.1	- 3	1.21		- 3.3
99	9		-2.9	7	8.41		-20.3
100	10		-1.9	-13	3.61		24.7
101	10		-1.9	-28	3.61		53.2
102	12		.1	- 3	.01		- .3
103	12		.1	7	.01		.7
104	13		1.1	7	1.21		7.7
105	9		-2.9	-13	8.41		37.7
106	16		4.1	7	16.81		28.7
107	10		-1.9	7	3.61		-13.3
108	14		2.1	- 3	4.41		- 6.3
109	14		2.1	7	4.41		14.7
110	14		2.1	- 3	4.41		- 6.3
111	12		0.1	- 3	.01		- .3
112	11		- .9	-13	.81		11.7
113	11		- .9	-13	.81		11.7
114	15		3.1	7	9.61		21.7
115	15		3.1	17	9.61		52.7
116	18		6.1	- 3	37.21		-18.3
117	12		.1	- 3	.01		- .3
118	12		.1	7	.01		.7
119	13		1.1	- 3	1.21		- 3.3
120	16		4.1	7	16.81		28.7
121	16		4.1	17	16.81		69.7
122	8		-3.9	7	15.21		-27.3
123	14		2.1	-13	4.41		-27.3
124	12		.1	7	.01		.7
125	8		-3.9	7	15.21		-27.3
126	13		1.1	- 3	1.21		- 3.3
127	11		- .9	- 3	.81		2.7
128	12		.1	7	.01		.7
129	13		1.1	17	1.21		18.7
130	13		1.1	- 3	1.21		- 3.3
131	12		.1	7	.01		.7
132	12		.1	- 3	.01		- .3
133	12		.1	- 3	.01		- .3
134	15		3.1	- 3	9.61		- 9.3
135	12		.1	17	.01		1.7
136	12		.1	7	.01		.7
137	10		-1.9	-13	3.61		24.7
138	9		-2.9	-13	8.41		37.7
139	11		- .9	7	.81		- 6.3
140	11		- .9	7	.81		- 6.3
141	14		2.1	17	4.41		35.7
142	8		-3.9	-13	15.21		50.7
143	10		-1.9	7	3.61		-13.3
144	10		-1.9	- 3	3.61		5.7

TABLE V A (1953)

No.	X	Y	X	Y	X	Y	X	Y
96	13	1.1	1.1	-	3	1.81	1.81	1.81
97	11	1.1	1.1	-	13	1.81	1.81	1.81
98	13	1.1	1.1	-	3	1.81	1.81	1.81
99	9	1.1	1.1	-	7	1.81	1.81	1.81
100	10	1.1	1.1	-	13	1.81	1.81	1.81
101	10	1.1	1.1	-	13	1.81	1.81	1.81
102	13	1.1	1.1	-	3	1.81	1.81	1.81
103	13	1.1	1.1	-	7	1.81	1.81	1.81
104	13	1.1	1.1	-	7	1.81	1.81	1.81
105	9	1.1	1.1	-	13	1.81	1.81	1.81
106	13	1.1	1.1	-	7	1.81	1.81	1.81
107	10	1.1	1.1	-	7	1.81	1.81	1.81
108	14	1.1	1.1	-	3	1.81	1.81	1.81
109	14	1.1	1.1	-	7	1.81	1.81	1.81
110	14	1.1	1.1	-	3	1.81	1.81	1.81
111	13	1.1	1.1	-	3	1.81	1.81	1.81
112	11	1.1	1.1	-	13	1.81	1.81	1.81
113	11	1.1	1.1	-	13	1.81	1.81	1.81
114	13	1.1	1.1	-	7	1.81	1.81	1.81
115	13	1.1	1.1	-	17	1.81	1.81	1.81
116	18	1.1	1.1	-	3	1.81	1.81	1.81
117	13	1.1	1.1	-	3	1.81	1.81	1.81
118	13	1.1	1.1	-	7	1.81	1.81	1.81
119	13	1.1	1.1	-	3	1.81	1.81	1.81
120	16	1.1	1.1	-	7	1.81	1.81	1.81
121	16	1.1	1.1	-	17	1.81	1.81	1.81
122	8	1.1	1.1	-	7	1.81	1.81	1.81
123	14	1.1	1.1	-	13	1.81	1.81	1.81
124	13	1.1	1.1	-	7	1.81	1.81	1.81
125	9	1.1	1.1	-	7	1.81	1.81	1.81
126	13	1.1	1.1	-	3	1.81	1.81	1.81
127	11	1.1	1.1	-	3	1.81	1.81	1.81
128	13	1.1	1.1	-	7	1.81	1.81	1.81
129	13	1.1	1.1	-	17	1.81	1.81	1.81
130	13	1.1	1.1	-	3	1.81	1.81	1.81
131	13	1.1	1.1	-	7	1.81	1.81	1.81
132	13	1.1	1.1	-	3	1.81	1.81	1.81
133	13	1.1	1.1	-	3	1.81	1.81	1.81
134	12	1.1	1.1	-	3	1.81	1.81	1.81
135	13	1.1	1.1	-	17	1.81	1.81	1.81
136	13	1.1	1.1	-	7	1.81	1.81	1.81
137	10	1.1	1.1	-	13	1.81	1.81	1.81
138	9	1.1	1.1	-	13	1.81	1.81	1.81
139	11	1.1	1.1	-	7	1.81	1.81	1.81
140	11	1.1	1.1	-	7	1.81	1.81	1.81
141	14	1.1	1.1	-	17	1.81	1.81	1.81
142	8	1.1	1.1	-	13	1.81	1.81	1.81
143	10	1.1	1.1	-	7	1.81	1.81	1.81
144	10	1.1	1.1	-	3	1.81	1.81	1.81

TABLE V d (1935)

No.	X	Y	x	y	x ²	y ²	xy
145	13	Same as	1.1	17	1.21	Same as	18.7
146	10	in Table	-1.9	-43	3.61	in Table	81.7
147	16	III c	4.1	7	16.81	III c	28.7
148	11		-.9	-3	.81		2.7
149	10		-1.9	-3	3.61		5.7
150	12		.1	-28	.01		-2.8
151	8		-3.9	-43	15.21		167.77
152	12		.1	-3	.01		-3.3
153	13		1.1	-3	1.21		-6.3
154	14		2.1	-3	4.41		-14.3
155	13		1.1	-13	1.21		-.3
156	12		.1	-3	.01		-13.3
157	10		-1.9	7	3.61		.7
158	12		.1	7	.01		1.7
159	12		.1	17	.01		-6.3
160	11		-.9	7	.81		-1.3
161	12		.1	-13	.01		11.7
162	11		-.9	-13	.81		-27.3
163	8		-3.9	7	15.21		11.7
164	8		-3.9	-3	15.21		.7
165	12		.1	7	.01		35.7
166	17		5.1	7	26.01		.7
167	12		.1	7	.01		-3.3
168	13		1.1	-3	1.21		14.7
169	14		2.1	7	4.41		-49.3
170	9		-2.9	17	8.41		37.7
171	9		-2.9	-13	8.41		35.7
172	14		2.1	17	4.41		.7
173	12		.1	7	.01		7.7
174	13		1.1	7	1.21		5.7
175	10		-1.9	-3	3.61		11.7
176	8		-3.9	-3	15.21		11.7
177	11		-.9	-13	.81		21.7
178	15		3.1	7	9.61		21.7
179	15		3.1	7	9.61		18.7
180	13		1.1	17	1.21		-2.8
181	12		.1	-28	.01		.7
182	12		.1	7	.01		----
183	--		--	--	----		5.7
184	10		-1.9	-3	3.61		76.7
185	6		-5.9	-13	34.81		86.7
186	17		5.1	17	26.01		-32.3
187	10		-1.9	17	3.61		7.7
188	13		1.1	7	1.21		.7
189	12		.1	7	.01		-6.3
190	14		2.1	-3	4.41		5.7
191	10		-1.9	-3	3.61		7.7
192	13		1.1	7	1.21		.7
193	12		.1	7	.01		

TABLE V 4 (1935)

No.	X	Y	X	Y	X	Y
145	12	Game as	1.1	17	1.21	Game as
146	10	in Table-1.9	-48	-48	3.61	in Table
147	16	111 2	4.1	7	16.81	111 c
148	11	- .9	- .9	3	.81	
149	10	-1.9	-1.9	3	3.61	
150	12	.1	.1	-28	.01	
151	8	-3.9	-3.9	-48	16.81	
152	12	.1	.1	3	.01	
153	13	1.1	1.1	3	1.21	
154	14	2.1	2.1	3	4.41	
155	13	1.1	1.1	-13	1.21	
156	12	.1	.1	3	.01	
157	10	-1.9	-1.9	7	3.61	
158	12	.1	.1	7	.01	
159	12	.1	.1	17	.01	
160	11	- .9	- .9	7	.81	
161	12	.1	.1	-13	.01	
162	11	- .9	- .9	-13	.81	
163	8	-3.9	-3.9	7	16.81	
164	8	-3.9	-3.9	3	16.81	
165	12	.1	.1	7	.01	
166	17	2.1	2.1	7	28.01	
167	12	.1	.1	7	.01	
168	13	1.1	1.1	3	1.21	
169	14	2.1	2.1	7	4.41	
170	9	-2.9	-2.9	17	8.41	
171	9	-2.9	-2.9	-13	8.41	
172	14	2.1	2.1	17	4.41	
173	12	.1	.1	7	.01	
174	13	1.1	1.1	7	1.21	
175	10	-1.9	-1.9	3	3.61	
176	8	-3.9	-3.9	3	16.81	
177	11	- .9	- .9	-13	.81	
178	12	2.1	2.1	7	9.61	
179	12	2.1	2.1	7	9.61	
180	12	1.1	1.1	17	1.21	
181	12	.1	.1	-28	.01	
182	12	.1	.1	7	.01	
183	--	--	--	--	--	
184	10	-1.9	-1.9	3	3.61	
185	6	-2.9	-2.9	-13	24.81	
186	17	2.1	2.1	17	28.01	
187	10	-1.9	-1.9	17	3.61	
188	12	1.1	1.1	7	1.21	
189	12	.1	.1	7	.01	
190	14	2.1	2.1	3	4.41	
191	10	-1.9	-1.9	3	3.61	
192	12	1.1	1.1	7	1.21	
193	12	.1	.1	7	.01	

TABLE V d (1935)

No.	X	Y	x	y	x ²	y ²	xy
194	10	Same as	-1.9	17	3.61	Same as	- 32.3
195	12	Table III	.1	- 3	.01	Table III	- .3
		c			c		

193	2,295				846.73	27,792	834
	11.9						

Correlating, $r = \frac{834}{\sqrt{846.73} \times \sqrt{27,792}}$

$$r = \frac{834}{29.1 \times 166.71} = 0.172$$

$$P.E. = \frac{.6745 \times (.9704)}{13.89} = .0471$$

TABLE IV e (1934)

Correlation of Army Alpha Arithmetic Section
and Algebra Final Grades

No.	X	Y	x	y	x^2	y^2	xy
34-1	20	Same as	8	16	64	same as	128
2	15	in Table	3	6	9	in Table	18
3	11	III e	- 1	16	1	III e	- 16
4	12		0	- 4	0		0
5	15		3	16	9		48
6	12		0	- 4	0		0
7	10		- 2	- 4	4		8
8	12		0	-14	0		0
9	10		- 2	- 4	4		8
10	12		0	16	0		0
11	18		6	- 4	36		- 24
12	10		- 2	6	4		- 12
13	11		- 1	6	1		- 6
14	10		- 2	16	4		- 32
15	11		- 1	6	1		- 6
16	11		- 1	6	1		- 6
17	13		1	- 4	1		- 4
18	14		2	- 4	4		- 8
19	16		4	6	16		24
20	10		- 2	- 4	4		8
21	12		0	6	0		0
22	11		- 1	- 4	1		4
23	14		2	- 4	4		- 8
24	10		0	-14	0		0
25	10		0	- 4	0		0
26	13		1	- 4	1		- 4
27	12		0	-29	0		0
28	14		2	16	4		32
29	--		---	--	-		---
30	11		- 1	- 4	1		4
31	13		1	6	1		6
32	--		---	--	-		---
33	13		1	6	1		6
34	11		- 1	- 4	1		4
35	11		- 1	- 4	1		4
36	11		- 1	6	1		- 6
37	15		3	6	9		18
38	15		3	16	9		48
39	13		1	-14	1		- 14
40	10		- 2	-14	4		28
41	9		- 3	- 4	9		12
42	17		5	- 4	25		- 20
43	9		- 3	-14	9		42
44	15		3	- 4	9		- 12
45	14		2	-14	4		- 28

TABLE V-a (1954)

Correlation of Army Alpha Arithmetic Section
and Algebra Final Grades

No.	X	Y	X	Y	X	Y	xy
34-1	80	Same as	8	18	64	Same as	128
2	18	in Table	2	8	9	in Table	18
3	11	111 e	1	18	1	111 e	18
4	12		0	-4	0		0
5	18		2	18	9		48
6	12		0	-4	0		0
7	10		2	-4	4		8
8	12		0	-14	0		0
9	10		2	-4	4		8
10	12		0	18	0		0
11	18		8	-4	36		34
12	10		2	8	4		12
13	11		1	8	1		8
14	10		2	18	4		32
15	11		1	8	1		8
16	11		1	8	1		8
17	12		1	-4	1		4
18	14		2	-4	4		8
19	18		4	8	16		34
20	10		2	-4	4		8
21	12		0	8	0		0
22	11		1	-4	1		4
23	14		2	-4	4		8
24	10		0	-14	0		0
25	10		0	-4	0		0
26	12		1	-4	1		4
27	12		0	-24	0		0
28	14		2	18	4		32
29	--		--	--	--		--
30	11		1	-4	1		4
31	12		1	8	1		8
32	--		--	--	--		--
33	12		1	8	1		8
34	11		1	-4	1		4
35	11		1	-4	1		4
36	11		1	8	1		8
37	18		2	8	9		18
38	18		2	18	9		48
39	12		1	-14	1		14
40	10		2	-14	4		8
41	9		2	-4	9		18
42	17		8	-4	36		30
43	9		2	-14	9		34
44	18		2	-4	9		18
45	14		2	-14	4		30

TABLE IV e (1934)

No.	X	Y	x	y	x^2	y^2	xy
46	12		0	6	0		0
47	11		- 1	- 4	1		5
48	12		0	-14	0		0
49	10		- 2	6	4		- 12
50	14		2	-29	4		- 58
51	12		0	6	0		0
52	10		- 2	- 4	4		8
53	11		- 1	6	1		- 6
54	10		- 2	- 4	4		8
55	10		- 2	6	4		- 12
56	12		0	6	0		0
57	14		2	6	4		12
58	11		- 1	- 4	1		4
59	11		- 1	6	1		- 6
60	13		1	- 4	1		- 4
61	7		- 5	-29	25		145
62	12		0	6	0		0
63	10		- 2	- 4	4		8
64	12		0	- 4	0		0
65	14		2	-14	4		- 28
66	7		- 5	-29	25		145
67	11		- 1	16	1		- 16
68	17		5	6	25		30
69	13		1	6	1		6
70	9		- 3	- 4	9		12
71	13		1	- 4	1		- 4
72	12		0	6	0		0
73	10		- 2	-14	4		28
74	1		-11	6	121		- 66
75	12		0	16	0		0
76	9		- 3	6	9		- 18
77	12		0	-14	0		0
78	12		0	6	0		0
79	11		- 1	6	1		- 6
80	15		3	6	9		18
81	10		- 2	- 4	4		8
82	11		- 1	6	1		- 6
83	11		- 1	6	1		- 6
84	11		- 1	- 4	1		4
85	11		- 1	- 4	1		4
86	12		0	6	0		0
87	16		4	6	16		24
88	17		5	16	25		80
89	15		3	-14	9		- 42
90	12		0	16	0		0
91	11		- 1	6	1		- 6
92	16		4	- 4	16		- 16
93	10		- 2	-14	4		28
94	12		0	-14	0		0

1934	1935	1936	1937	1938	1939	1940
12	12	12	12	12	12	12
13	13	13	13	13	13	13
14	14	14	14	14	14	14
15	15	15	15	15	15	15
16	16	16	16	16	16	16
17	17	17	17	17	17	17
18	18	18	18	18	18	18
19	19	19	19	19	19	19
20	20	20	20	20	20	20
21	21	21	21	21	21	21
22	22	22	22	22	22	22
23	23	23	23	23	23	23
24	24	24	24	24	24	24
25	25	25	25	25	25	25
26	26	26	26	26	26	26
27	27	27	27	27	27	27
28	28	28	28	28	28	28
29	29	29	29	29	29	29
30	30	30	30	30	30	30
31	31	31	31	31	31	31
32	32	32	32	32	32	32
33	33	33	33	33	33	33
34	34	34	34	34	34	34
35	35	35	35	35	35	35
36	36	36	36	36	36	36
37	37	37	37	37	37	37
38	38	38	38	38	38	38
39	39	39	39	39	39	39
40	40	40	40	40	40	40
41	41	41	41	41	41	41
42	42	42	42	42	42	42
43	43	43	43	43	43	43
44	44	44	44	44	44	44
45	45	45	45	45	45	45
46	46	46	46	46	46	46
47	47	47	47	47	47	47
48	48	48	48	48	48	48
49	49	49	49	49	49	49
50	50	50	50	50	50	50
51	51	51	51	51	51	51
52	52	52	52	52	52	52
53	53	53	53	53	53	53
54	54	54	54	54	54	54
55	55	55	55	55	55	55
56	56	56	56	56	56	56
57	57	57	57	57	57	57
58	58	58	58	58	58	58
59	59	59	59	59	59	59
60	60	60	60	60	60	60
61	61	61	61	61	61	61
62	62	62	62	62	62	62
63	63	63	63	63	63	63
64	64	64	64	64	64	64
65	65	65	65	65	65	65
66	66	66	66	66	66	66
67	67	67	67	67	67	67
68	68	68	68	68	68	68
69	69	69	69	69	69	69
70	70	70	70	70	70	70
71	71	71	71	71	71	71
72	72	72	72	72	72	72
73	73	73	73	73	73	73
74	74	74	74	74	74	74
75	75	75	75	75	75	75
76	76	76	76	76	76	76
77	77	77	77	77	77	77
78	78	78	78	78	78	78
79	79	79	79	79	79	79
80	80	80	80	80	80	80
81	81	81	81	81	81	81
82	82	82	82	82	82	82
83	83	83	83	83	83	83
84	84	84	84	84	84	84
85	85	85	85	85	85	85
86	86	86	86	86	86	86
87	87	87	87	87	87	87
88	88	88	88	88	88	88
89	89	89	89	89	89	89
90	90	90	90	90	90	90
91	91	91	91	91	91	91
92	92	92	92	92	92	92
93	93	93	93	93	93	93
94	94	94	94	94	94	94
95	95	95	95	95	95	95
96	96	96	96	96	96	96
97	97	97	97	97	97	97
98	98	98	98	98	98	98
99	99	99	99	99	99	99
100	100	100	100	100	100	100

TABLE IV e (1934)

No.	X	Y	x	y	x ²	y ²	xy
95	12		0	- 4	0		0
96	12		0	6	0		0
97	11		- 1	- 4	1		4
98	11		- 1	- 4	1		4
99	12		0	- 4	0		0
100	12		0	- 4	0		0
101	13		1	- 4	1		- 4
102	8		- 4	6	16		- 24
103	12		0	6	0		0
104	12		0	- 4	0		0
105	--		---	---	--		---
106	12		0	6	0		0
107	14		2	6	4		12
108	11		- 1	6	1		- 6
109	15		3	6	9		18
110	14		2	6	4		12
111	12		0	-14	0		0
112	11		-1	6	1		- 6
113	10		- 2	- 4	4		8
114	11		- 1	16	1		- 16
115	15		3	16	9		48
116	13		1	- 4	1		- 4
117	14		2	- 4	4		- 8
118	12		0	16	0		0
119	13		1	16	1		16
120	11		- 1	6	1		- 6
121	10		- 2	6	4		- 12
122	11		- 1	6	1		- 6
123	11		- 1	16	1		- 16
124	12		0	6	0		0
125	11		- 1	-29	1		29
126	15		3	6	9		18
123	1476	79			680	13,393.	584
	12	79					

$$\text{Correlating, } r = \frac{584}{\sqrt{680} \times \sqrt{13,393}} = \frac{584}{26.08 \times 115.7} = 0.193$$

$$\text{P.E.} = \frac{.6745 \times (1-.035)}{\sqrt{123}} = \frac{.651}{11.09} = .0587$$

TABLE IV e VI 21821
(1934)

No.	X	Y	X	Y	X	Y	X	Y
88	16		0	-	0		0	
89	13		0		0		0	
90	11		1	-	1		1	
91	11		1	-	1		1	
92	12		0	-	0		0	
93	12		0	-	0		0	
94	13		1	-	1		1	
95	8		4	-	4		4	
96	12		0		0		0	
97	12		0	-	0		0	
98	12		0	-	0		0	
99	12		0	-	0		0	
100	12		0	-	0		0	
101	12		0	-	0		0	
102	12		0	-	0		0	
103	12		0	-	0		0	
104	12		0	-	0		0	
105	12		0	-	0		0	
106	12		0	-	0		0	
107	14		2		2		2	
108	11		1	-	1		1	
109	15		3		3		3	
110	14		2		2		2	
111	12		0	-14	0		0	
112	11		1	-	1		1	
113	10		2	-	2		2	
114	11		1	-	1		1	
115	12		3		3		3	
116	12		1	-	1		1	
117	14		2	-	2		2	
118	12		0		0		0	
119	12		1		1		1	
120	11		1	-	1		1	
121	10		2	-	2		2	
122	11		1	-	1		1	
123	11		1	-	1		1	
124	12		0		0		0	
125	11		1	-	1		1	
126	12		0		0		0	
127	12		0		0		0	
128	12		0		0		0	
129	12		0		0		0	
130	12		0		0		0	
131	12		0		0		0	
132	12		0		0		0	
133	12		0		0		0	
134	12		0		0		0	
135	12		0		0		0	
136	12		0		0		0	
137	12		0		0		0	
138	12		0		0		0	
139	12		0		0		0	
140	12		0		0		0	
141	12		0		0		0	
142	12		0		0		0	
143	12		0		0		0	
144	12		0		0		0	
145	12		0		0		0	
146	12		0		0		0	
147	12		0		0		0	
148	12		0		0		0	
149	12		0		0		0	
150	12		0		0		0	
151	12		0		0		0	
152	12		0		0		0	
153	12		0		0		0	
154	12		0		0		0	
155	12		0		0		0	
156	12		0		0		0	
157	12		0		0		0	
158	12		0		0		0	
159	12		0		0		0	
160	12		0		0		0	
161	12		0		0		0	
162	12		0		0		0	
163	12		0		0		0	
164	12		0		0		0	
165	12		0		0		0	
166	12		0		0		0	
167	12		0		0		0	
168	12		0		0		0	
169	12		0		0		0	
170	12		0		0		0	
171	12		0		0		0	
172	12		0		0		0	
173	12		0		0		0	
174	12		0		0		0	
175	12		0		0		0	
176	12		0		0		0	
177	12		0		0		0	
178	12		0		0		0	
179	12		0		0		0	
180	12		0		0		0	
181	12		0		0		0	
182	12		0		0		0	
183	12		0		0		0	
184	12		0		0		0	
185	12		0		0		0	
186	12		0		0		0	
187	12		0		0		0	
188	12		0		0		0	
189	12		0		0		0	
190	12		0		0		0	
191	12		0		0		0	
192	12		0		0		0	
193	12		0		0		0	
194	12		0		0		0	
195	12		0		0		0	
196	12		0		0		0	
197	12		0		0		0	
198	12		0		0		0	
199	12		0		0		0	
200	12		0		0		0	

Correlation, $r = \frac{484}{12.00} = 40.33$

$\sqrt{484} \times \sqrt{12.00} = 22.00 \times 3.464 = 76.21$

$r = \frac{484}{76.21} = 6.35$

Conclusions.

142.

Class	1938	1937	1936	1935	1934
Test Used	Well's Revision	Well's Revision	Original Alpha	Original Alpha	Original Alpha
Coefficient of Correlation	.47	.19	.286	.172	.193
Cases Studied	238	340	276	194	124

A survey of the above values of correlation coefficients shows that there is a positive relation between the scores on the arithmetic section of the Army Alpha and the final algebra grades. The relation is slight, however, and is less close than that existing between the algebra placement test results and the total score on the Army Alpha.

Neither of these relations are close enough to be of any practical use in forming algebra sections so the placement test must be retained as long as sectioning is carried on.

The correlation coefficients are somewhat erratic and one of the two higher values appears with the revised Alpha while the other is obtained from the original form.

The coefficients for the classes of '34 and '35 are almost exactly equal to four times their probable error, a minimum requirement before a test indicates any relation whatever.

This relation apparently has no practical value and will be eliminated from further consideration.

Conclusions.

124.

Class	Test Used	Coefficient of Correlation	Class Studied
1936	Well's Revision	.47	238
1937	Well's Revision	.19	240
1938	Original Alpha	.286	276
1939	Original Alpha	.173	194
1940	Original Alpha	.193	184

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Chapter V.RELATION OF ARMY ALPHA SCORES TO HIGH SCHOOL SCHOLASTIC AVERAGE.

As all of the necessary data is available it is believed to be of interest to see if any close relation exists between the total scholastic average of the student made in high school and the Army Alpha total scores. These scores and grades will not be truly comparable as there is a considerable time lag between the time when the grades were obtained and the date on which the Army Alpha was taken. The high school grades being scattered over the entire four years of secondary school attendance while the Alpha was taken at the beginning of their college work. The mental progress made in this formative period would without doubt show a very definite increase in score made on any good intelligence test if the group were tested at the beginning and end of the period. Since the same time interval has elapsed in each case, however, the scores and grades in each class should be comparable, all other things being equal.

When this study was first contemplated it was feared that differences in grading systems in vogue in the different high schools would make impossible any comparison of students on this basis. A survey of transcripts of high school records available, however, showed a remarkable similarity among the different schools in grading systems used,

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as far as the grade scales are concerned. There probably is an appreciable difference in interpretation of these grade scales in different schools but it would be impossible to evaluate these differences without intimate knowledge of the faculty and the scholastic ideals of each school administration.

High school grades are subject to the same variations between ability and accomplishment which have been noted in connection with college grades. In addition, high school students suffer more from diffusion of interests than college students. In the earlier years of high school very few students have any notion of what trade or profession they wish to follow, they can see very little connection between the subjects studied and their future needs, and many are urged on much against their wishes by parental pressure. College students in a professional school, especially in these times of financial stress, are in most cases at least passively interested in acquiring the subject matter offered.

It is easily seen that high school grades are, of necessity, somewhat unreliable as indicators of future performance, but the total scholastic averages of the class of '38 will be correlated with their corresponding Army Alpha scores. If a reasonably high value of r is found other classes will be studied, otherwise this relation will be discarded from consideration.

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TABLE VI a (1938)

Correlation of High School Grades and Army Alpha

No.	X	Y	x	y	x ²	y ²	xy
1	75	127	- 1	- 7.7	1	59.29	7.7
2	75	89	- 1	-45.7	1	2088.49	45.7
3	75	99	- 1	-35.7	1	1274.49	35.7
4	65	125	-11	- 9.7	121	94.09	106.7
5	65	138	-11	3.3	121	10.89	- 36.3
6	65	119	-11	-15.7	121	246.49	172.7
7	75	122	- 1	-12.7	1	161.29	12.7
8	75	147	- 1	12.3	1	151.29	- 12.3
9	65	105	-11	-29.7	121	882.09	326.7
10	65	80	-11	-54.7	121	2992.09	601.7
11	85	137	9	2.3	81	5.29	20.7
12	65	139	-11	4.3	121	18.49	-49.3
13	85	141	9	6.3	81	39.69	56.7
14	75	104	- 1	-30.7	1	942.49	30.7
15	65	114	-11	-20.7	121	428.49	227.7
16	75	157	- 1	22.3	1	497.29	- 22.3
17	85	158	9	23.3	81	542.89	209.7
18	85	124	9	-10.7	81	114.49	- 96.3
19	75	127	- 1	- 7.7	1	59.29	7.7
20	75	136	- 1	1.3	1	1.69	- 1.3
21	75	111	- 1	-23.7	1	561.69	23.7
22	85	116	9	-18.7	81	349.69	-168.3
23	75	108	- 1	-26.7	1	712.89	26.7
24	95	167	19	32.3	361	1043.29	613.7
25	75	125	- 1	- 9.7	1	94.09	9.7
26	95	106	19	-28.7	361	823.69	-545.3
27	75	151	- 1	16.3	1	265.69	- 16.3
28	65	119	-11	-15.7	121	246.49	172.7
29	85	136	9	1.3	81	1.69	11.7
30	65	103	-11	-31.7	121	1004.89	348.7
31	75	121	- 1	-13.7	1	187.69	13.7
32	85	89	9	-45.7	81	2088.49	-411.3
33	75	160	- 1	25.7	1	640.09	- 25.7
34	75	151	- 1	16.3	1	265.69	- 16.3
35	75	118	- 1	-16.7	1	278.89	16.7
36	75	155	- 1	20.3	1	412.09	- 20.3
37	75	154	- 1	19.3	1	372.49	- 19.3
38	85	136	9	1.3	81	1.69	11.7
39	85	150	9	15.7	81	234.09	141.3
40	85	171	9	36.3	81	1317.69	326.7
41	85	119	9	-15.7	81	246.49	-141.3
42	75	134	- 1	- 0.7	1	.49	0.7
43	85	116	9	-18.7	81	349.69	-168.3
44	75	141	- 1	6.3	1	39.69	- 6.3
45	75	140	- 1	5.3	1	28.09	- 5.3
46	85	165	9	30.3	81	918.09	272.7

Correlation of High School Grades and Army Alpha

No.	X	Y	X	Y	X	Y	X	Y
1	75	127	1	-7.7	1	59.39	1	7.7
2	75	89	1	-45.7	1	8088.49	1	45.7
3	75	99	1	-35.7	1	1274.49	1	35.7
4	85	125	11	-9.7	121	94.09	109.7	109.7
5	85	138	11	8.3	121	10.89	-35.5	-35.5
6	85	119	11	-15.7	121	848.49	178.7	178.7
7	75	122	1	-12.7	1	161.29	12.7	12.7
8	75	147	1	12.3	1	161.29	-12.3	-12.3
9	85	108	11	-39.7	121	882.09	389.7	389.7
10	85	80	11	-54.7	121	8932.09	547.7	547.7
11	85	137	9	2.3	81	5.29	20.7	20.7
12	85	139	11	4.3	121	18.49	-43.3	-43.3
13	85	141	9	6.3	81	39.69	63.7	63.7
14	75	104	1	-30.7	1	942.49	30.7	30.7
15	85	114	11	-20.7	121	428.49	20.7	20.7
16	75	127	1	22.3	1	497.89	-22.3	-22.3
17	85	128	9	22.3	81	548.89	202.7	202.7
18	85	124	9	-10.7	81	114.49	-82.3	-82.3
19	75	127	1	-7.7	1	59.39	7.7	7.7
20	75	125	1	1.3	1	1.69	-1.3	-1.3
21	75	111	1	-25.7	1	561.69	25.7	25.7
22	85	115	9	-18.7	81	349.69	-102.3	-102.3
23	75	108	1	-22.7	1	518.89	22.7	22.7
24	95	127	19	32.3	361	1048.89	612.7	612.7
25	75	125	1	-9.7	1	94.09	9.7	9.7
26	95	105	19	-28.7	361	828.89	-842.3	-842.3
27	75	121	1	12.3	1	152.89	-12.3	-12.3
28	85	119	11	-15.7	121	848.49	178.7	178.7
29	85	122	9	1.3	81	1.69	11.7	11.7
30	85	102	11	-21.7	121	1004.89	242.7	242.7
31	75	121	1	-12.7	1	157.69	12.7	12.7
32	85	89	9	-45.7	81	8088.49	-41.3	-41.3
33	75	120	1	25.7	1	649.09	25.7	25.7
34	75	121	1	12.3	1	152.89	-12.3	-12.3
35	75	125	1	-12.7	1	157.69	12.7	12.7
36	75	125	1	20.3	1	412.09	-20.3	-20.3
37	75	124	1	12.3	1	152.89	-12.3	-12.3
38	85	122	9	1.3	81	1.69	11.7	11.7
39	85	120	9	12.7	81	161.69	121.3	121.3
40	85	171	9	32.3	81	1047.89	222.7	222.7
41	85	119	9	-15.7	81	248.49	-141.3	-141.3
42	75	124	1	-0.7	1	.49	0.7	0.7
43	85	116	9	-18.7	81	349.69	-102.3	-102.3
44	75	141	1	6.3	1	39.69	6.3	6.3
45	75	140	1	5.3	1	28.09	5.3	5.3
46	85	122	9	30.3	81	918.09	372.7	372.7

TABLE VI a (1938)

No.	X	Y	x	y	x ²	y ²	xy
47	75	132	- 1	- 2.7	1	7.29	2.7
48	75	148	- 1	13.3	1	176.89	- 13.3
49	75	116	- 1	-18.7	1	349.69	18.7
50	75	96	- 1	-38.7	1	1497.69	38.7
51	85	136	9	1.3	81	1.69	11.7
52	75	127	- 1	- 7.7	1	59.29	7.7
53	75	137	- 1	2.3	1	5.29	- 2.3
54	85	152	9	17.3	81	299.29	155.7
55	65	53	-11	18.3	121	334.89	-201.3
56	75	109	- 1	-25.7	1	660.49	25.7
57	65	116	-11	-18.7	121	349.69	205.7
58	75	163	- 1	28.3	1	800.89	- 28.3
59	85	137	9	2.3	81	5.29	20.7
60	75	144	-11	9.3	121	86.49	-102.3
61	75	154	- 1	19.3	1	372.49	- 19.3
62	85	136	9	1.3	81	1.69	11.7
63	75	127	- 1	- 7.7	1	59.29	7.7
64	65	122	-11	-12.7	121	161.29	139.7
65	85	148	9	13.3	81	176.89	119.7
66	65	151	-11	16.3	121	265.69	-179.3
67	75	121	- 1	-13.7	1	187.69	13.7
68	75	149	- 1	14.3	1	204.49	- 14.3
69	85	167	9	32.3	81	1069.29	290.7
70	85	125	9	- 9.7	81	94.09	- 87.3
71	65	126	-11	- 8.7	121	75.69	95.7
72	75	101	- 1	-33.7	1	1135.69	33.7
73	65	156	-11	21.3	121	453.69	-234.3
74	85	163	9	28.3	81	800.89	254.7
75	65	100	-11	-34.7	121	1204.09	381.7
76	75	134	- 1	- 0.7	1	.49	0.7
77	75	137	- 1	2.3	1	5.29	- 2.3
78	85	147	9	12.3	81	151.29	110.7
79	85	122	9	-12.7	81	161.29	-114.3
80	75	152	- 1	17.3	1	299.29	- 17.3
81	75	148	- 1	13.3	1	176.89	- 13.3
82	65	114	-11	-20.7	121	428.49	227.7
83	75	128	- 1	- 6.7	1	44.89	6.7
84	65	184	-11	49.3	121	2430.49	-542.3
85	65	149	-11	14.3	121	204.49	-157.3
86	75	115	- 1	-19.7	1	388.09	19.7
87	75	150	- 1	15.33	1	234.09	- 15.3
88	75	134	- 1	- 0.7	1	.49	.7
89	75	144	- 1	9.3	1	86.49	- 9.3
90	85	111	9	-23.7	81	561.69	-213.3
91	75	137	- 1	2.3	1	5.29	- 2.3
92	75	182	- 1	47.3	1	2237.29	47.3
93	65	121	-11	-13.7	121	181.69	150.7
94	75	154	- 1	19.3	1	372.49	- 19.3

TABLE VI a (1938)

No.	X	Y	Z	X	Y	Z
47	75	133	-	1	-	7.5
48	75	148	-	1	-	13.3
49	75	116	-	1	-	-18.7
50	75	96	-	1	-	-38.7
51	85	136	9	81	1.3	1.3
52	75	127	-	1	-	-7.7
53	75	127	-	1	-	3.3
54	85	123	9	81	17.3	33.3
55	65	53	-11	131	16.3	334.3
56	75	109	-	1	-	-55.7
57	65	116	-11	131	-18.7	349.3
58	75	133	-	1	-	800.3
59	65	127	9	81	3.3	3.3
60	75	144	-11	131	9.3	86.4
61	75	154	-	1	-	378.4
62	65	136	9	81	1.3	1.3
63	75	127	-	1	-	-7.7
64	65	123	-11	131	-12.7	181.3
65	85	148	9	81	13.3	178.3
66	65	161	-11	131	16.3	499.3
67	75	131	-	1	-	-13.7
68	75	149	-	1	-	14.3
69	85	167	9	81	32.3	1039.3
70	65	123	9	81	9.7	34.0
71	65	123	-11	131	-8.7	75.3
72	75	101	-	1	-	-32.7
73	65	159	-11	131	31.3	483.3
74	65	163	9	81	38.3	800.3
75	65	100	-11	131	-34.7	1804.0
76	75	134	-	1	-	-0.7
77	75	127	-	1	-	3.3
78	65	147	9	81	12.3	181.3
79	85	123	9	81	-12.7	123.3
80	75	123	-	1	-	17.3
81	75	148	-	1	-	13.3
82	65	114	-11	131	-20.7	438.4
83	75	128	-	1	-	-6.7
84	65	184	-11	131	48.3	3430.4
85	65	149	-11	131	14.3	304.4
86	75	112	-	1	-	-19.7
87	75	150	-	1	-	15.3
88	75	124	-	1	-	-0.7
89	75	144	-	1	-	9.3
90	85	111	9	81	-23.7	561.3
91	75	127	-	1	-	3.3
92	75	182	-	1	-	47.3
93	65	131	-11	131	-12.7	181.3
94	75	184	-	1	-	19.3

TABLE VI a (1938)

No.	X	Y	x	y	x ²	y ²	xy
95	75	128	- 1	- 6.7	1	44.89	6.7
96	65	149	-11	14.3	121	204.49	-157.3
97	85	146	9	11.3	81	127.69	101.7
98	75	124	- 1	-10.7	1	114.49	10.7
99	65	135	-11	0.3	121	.09	- 3.3
100	75	174	- 1	39.3	1	1544.49	- 39.3
101	85	134	9	- 0.7	81	.49	- 6.3
102	65	112	-11	-22.7	121	515.29	249.7
103	65	166	-11	31.3	121	979.69	-344.3
104	65	136	-11	1.3	121	1.69	- 14.3
105	85	124	9	-10.7	81	114.49	- 96.3
106	65	128	-11	- 6.7	121	44.89	73.7
107	75	145	- 1	10.3	1	106.09	- 10.3
108	75	126	- 1	- 8.7	1	75.69	8.7
109	75	60	- 1	-74.7	1	5580.09	74.7
110	75	148	- 1	13.3	1	176.89	- 13.3
111	75	89	- 1	-45.7	1	2088.49	45.7
112	65	181	-11	46.3	121	2143.69	-509.3
113	85	146	9	11.3	81	127.69	101.7
114	85	134	9	- 0.7	81	.49	- 6.3
115	65	113	-11	-21.7	121	470.89	238.7
116	65	104	-11	-30.7	121	936.36	337.7
117	85	141	9	6.3	81	39.69	56.7
118	85	149	9	14.3	81	204.49	128.7
119	85	135	9	.3	81	.09	2.7
120	65	161	-11	26.3	121	691.69	-289.3
121	75	120	- 1	-14.7	1	216.09	14.7
122	75	174	- 1	39.3	1	1544.49	-39.3
123	65	145	-11	10.3	121	106.09	-113.3
124	85	196	9	61.3	81	3757.69	551.7
125	85	132	9	- 2.7	81	7.29	- 24.3
126	75	110	- 1	-24.7	1	610.09	24.7
127	75	143	- 1	8.3	1	68.89	- 8.3
128	95	166	19	31.3	361	979.69	594.7
129	75	147	- 1	12.3	1	151.29	- 12.3
130	75	118	- 1	-16.7	1	278.89	16.7
131	75	132	-1	- 2.7	1	7.29	2.7
132	75	121	- 1	-13.7	1	187.69	13.7
133	85	149	9	14.3	81	204.49	128.7
134	75	113	- 1	-21.7	1	470.89	21.7
135	85	151	9	16.3	81	265.69	146.7
136	75	161	- 1	26.3	1	691.69	- 26.3
137	75	144	- 1	9.3	1	86.49	- 9.3
138	75	128	- 1	- 6.7	1	44.89	6.7
139	65	108	-11	-26.7	121	712.89	293.7
140	85	150	9	15.3	81	234.09	137.7
141	75	144	- 1	9.3	1	86.49	- 9.3
142	85	156	9	21.3	81	453.69	191.7

TABLE VI 8 (1958)

Mo.	Y	X	Y	X	S _x	S _y	X _y
95	75	-1	128	-0.7	1	88.44	7.6
96	65	-11	142	1.41	181	84.408	8.751-
97	85	9	146	1.11	81	127.69	101.7
98	75	-1	184	-10.7	1	114.43	10.7
99	65	-11	135	0.0	181	10.0	8.8 -
100	75	-1	174	8.98	1	184.44	8.8 -
101	85	9	184	-0.7	81	44	8.8 -
102	65	-11	115	-22.7	181	83.818	7.848
103	65	-11	168	31.8	181	83.878	8.44-
104	65	-11	136	1.8	181	1.88	8.14-
105	85	9	184	-10.7	81	114.43	8.8 -
106	65	-11	138	-6.7	181	44.88	7.87
107	75	-1	146	10.8	1	106.09	8.10 -
108	75	-1	136	-8.7	1	73.83	7.8
109	75	-1	60	-74.7	1	8880.08	7.47
110	75	-1	148	13.8	1	178.88	8.18 -
111	75	-1	89	-42.7	1	8088.48	7.84
112	65	-11	181	48.8	181	83.848	8.808-
113	85	9	146	11.8	81	127.69	101.7
114	65	9	134	-0.7	81	44	8.8 -
115	65	-11	115	-21.7	181	83.878	8.848
116	65	-11	104	-30.7	181	83.838	8.77
117	85	9	141	8.8	81	82.88	8.67
118	85	9	149	14.8	81	804.48	128.7
119	85	9	138	3	81	09	8.7
120	65	-11	181	29.8	181	83.818	8.848-
121	75	-1	180	-14.7	1	818.09	14.7
122	75	-1	174	28.8	1	184.44	-8.8-
123	65	-11	146	10.8	181	106.09	-11.8-
124	85	9	198	21.8	81	8787.88	881.7
125	65	9	138	-8.7	81	7.88	-8.84-
126	75	-1	110	-84.7	1	810.09	84.7
127	75	-1	148	8.8	1	88.88	-8.8-
128	65	18	168	31.8	381	878.88	84.7
129	75	-1	147	13.8	1	181.88	-12.8-
130	75	-1	118	-16.7	1	878.88	18.7
131	75	-1	138	-8.7	1	7.88	8.7
132	75	-1	181	-12.7	1	187.88	12.7
133	85	9	149	14.8	81	804.48	128.7
134	75	-1	115	-21.7	1	870.88	81.7
135	85	9	181	16.8	81	83.838	148.7
136	75	-1	161	28.8	1	891.69	-8.8-
137	75	-1	144	9.8	1	88.48	-8.7
138	75	-1	138	-6.7	1	44.88	6.7
139	65	-11	108	-28.7	181	83.818	8.848
140	85	9	180	18.8	81	184.09	137.7
141	75	-1	148	8.8	1	88.48	8.7
142	65	9	158	31.8	81	488.88	141.7

TABLE VI a (1938)

No.	X	Y	x	y	x ²	y ²	xy
143	65	124	-11	-10.7	121	114.49	117.7
144	75	123	-1	-11.7	1	136.89	11.7
145	85	124	9	-10.7	81	114.49	-96.3
146	75	130	-1	-4.7	1	22.09	4.7
147	85	135	9	0.3	81	.09	2.7
148	75	175	-1	40.3	1	1624.09	-40.3
149	85	100	9	-34.7	81	1204.09	-312.3
150	75	157	-1	22.3	1	497.29	-22.3
151	95	167	19	32.3	361	1043.29	613.7
152	65	135	-11	0.3	121	.09	-3.3
153	85	141	9	6.3	81	39.69	56.7
154	75	121	-1	-13.7	1	187.69	13.7
155	85	181	9	46.3	81	2143.69	416.7
156	65	141	-11	6.3	121	39.69	-69.3
157	85	152	9	17.3	81	299.29	155.7
158	75	166	-1	31.3	1	979.69	-31.3
159	75	115	-1	-19.7	1	388.09	19.7
160	85	156	9	21.3	81	453.69	191.7
161	75	142	-1	7.3	1	53.29	-7.3
162	75	124	-1	-10.7	1	114.49	10.7
163	75	134	-1	-0.7	1	.49	.7
164	75	125	-1	-9.7	1	94.09	9.7
165	85	129	9	-5.7	81	32.49	-51.3
166	75	132	-1	-2.7	1	7.29	2.7
167	75	102	-1	-32.7	1	1069.29	32.7
168	65	126	-11	-8.7	121	75.69	95.7
169	65	133	-11	-1.7	121	2.89	18.7
170	75	150	-1	15.3	1	234.09	-15.3
171	75	150	-1	15.3	1	234.09	-15.3
172	65	126	-11	-8.7	121	68.89	95.7
173	75	106	-1	-28.7	1	800.89	28.7
174	75	149	-1	14.3	1	204.49	-14.3
175	75	144	-1	19.3	1	86.49	-19.3
176	75	132	-1	-2.7	1	7.29	2.7
177	75	124	-1	-10.7	1	114.49	10.7
178	75	140	-1	5.3	1	28.09	-5.3
179	85	164	9	29.3	81	858.49	263.7
180	65	134	-11	-0.7	121	.49	7.7
181	75	154	-1	19.3	1	372.49	-19.3
182	75	123	-1	-11.7	1	136.89	11.7
183	75	141	-1	6.3	1	39.69	-6.3
184	75	124	-1	-10.7	1	114.49	10.7
185	85	150	9	15.3	81	234.09	137.7
186	75	125	-1	-9.7	1	94.09	9.7
187	85	134	9	-0.7	81	.49	-6.3
188	75	138	-1	3.3	1	10.09	-3.3
189	95	122	19	-12.7	361	161.29	-241.3
190	75	138	-1	3.3	1	10.09	-3.3

TABLE VI & (1938)

No.	X	Y	X	Y	X	Y	X
143	65	184	-11	-10.7	181	114.4	117.7
144	75	183	-1	-11.7	1	88.8	11.7
145	85	184	9	-10.7	81	114.4	-88.8
146	75	180	-1	-7.7	1	88.8	4.7
147	65	185	9	0.8	81	90.	8.7
148	75	175	-1	-10.8	1	188.4	-40.8
149	85	100	9	-10.7	81	180.4	-118.8
150	75	187	-1	-12.8	1	97.8	-88.8
151	95	187	19	12.8	81	104.8	818.7
152	65	185	-11	0.8	181	90.	-8.8
153	85	141	9	8.8	81	88.8	88.7
154	75	181	-1	-13.7	1	187.8	18.7
155	85	181	9	4.8	81	214.8	418.7
156	65	141	-11	8.8	181	88.8	-88.8
157	85	183	9	17.8	81	88.8	188.7
158	75	185	-1	-11.8	1	97.8	-81.8
159	75	118	-1	-19.7	1	88.8	18.7
160	85	185	9	11.8	81	488.8	181.7
161	75	143	-1	-7.8	1	88.8	-7.8
162	75	184	-1	-10.7	1	114.4	10.7
163	75	184	-1	-0.7	1	97.8	7.7
164	75	185	-1	-9.7	1	84.0	9.7
165	85	183	9	-8.7	81	88.4	-81.8
166	75	183	-1	-8.7	1	7.8	8.7
167	75	103	-1	-18.7	1	108.8	88.7
168	65	185	-11	-8.7	181	78.8	88.7
169	65	183	-11	-1.7	181	8.8	18.7
170	75	180	-1	-18.8	1	88.4	-18.8
171	75	180	-1	-18.8	1	88.4	-18.8
172	65	183	-11	-8.7	181	88.8	88.7
173	75	105	-1	-18.7	1	800.8	88.7
174	75	149	-1	-14.8	1	804.4	-14.8
175	75	144	-1	-19.8	1	88.4	-19.8
176	75	183	-1	-8.7	1	7.8	8.7
177	75	184	-1	-10.7	1	114.4	10.7
178	75	140	-1	-8.8	1	88.0	-8.8
179	85	184	9	18.8	81	88.4	88.7
180	65	184	-11	-0.7	181	49.	7.7
181	75	184	-1	-19.8	1	878.4	-19.8
182	75	183	-1	-11.7	1	188.8	11.7
183	75	141	-1	-8.8	1	88.8	-8.8
184	75	184	-1	-10.7	1	114.4	10.7
185	85	180	9	-18.8	81	88.4	188.7
186	75	185	-1	-9.7	1	84.0	9.7
187	85	184	9	-0.7	81	49.	-8.8
188	75	188	-1	-8.8	1	10.0	-8.8
189	95	183	19	-13.7	81	181.8	-81.8
190	75	183	-1	-8.8	1	10.0	-8.8

TABLE VI a (1938)

No.	X	Y	x	y	x ²	y ²	xy
191	65	123	-11	-11.7	121	136.89	128.7
192	85	161	9	26.3	81	691.69	236.7
193	75	141	-1	6.3	1	39.69	-6.3
194	65	131	-11	-3.7	121	10.09	40.7
195	75	112	-1	-22.7	1	515.29	22.7
196	85	137	9	2.3	81	5.29	20.7
197	65	170	-11	35.3	121	1246.09	-388.3
198	75	137	-1	2.3	1	5.29	-2.3
199	65	113	-11	-21.7	121	470.89	238.7
200	65	159	-11	24.3	121	590.49	2867.3
201	85	146	9	11.3	81	127.69	101.7
202	85	169	9	34.3	81	1176.49	308.7
203	85	148	9	13.3	81	176.89	119.7
204	85	139	9	4.3	81	18.49	38.7
205	75	144	-1	9.3	1	86.49	-9.3
206	85	131	9	-3.7	81	13.69	-33.3
207	65	132	-11	-2.7	121	7.29	29.7
208	75	128	-1	-6.7	1	44.89	6.7
209	75	149	-1	14.3	1	204.49	-14.3
210	95	154	9	19.3	81	372.49	173.7
211	65	141	-11	6.3	121	39.69	-69.3
212	75	171	-1	36.3	1	1317.69	-36.3
213	75	139	-1	5.3	1	28.09	-5.3
214	75	133	-1	-1.7	1	2.89	1.7
215	65	90	-11	-44.7	121	1998.09	491.7
216	75	141	-1	6.3	1	39.69	-6.3
217	85	149	9	15.3	81	234.09	137.7
218	85	130	9	-4.7	81	22.09	-42.3
219	75	136	-1	1.3	1	1.69	-1.3
220	65	136	-11	1.3	121	1.69	-14.3
221	85	122	9	-12.7	81	161.29	-114.3
222	85	148	9	13.3	81	176.89	119.7
223	75	147	-1	12.3	1	151.29	-12.3
224	65	107	-11	-27.7	121	767.29	304.7
225	65	119	-11	-15.7	121	246.49	172.7
226	65	135	-11	0.3	121	.09	-3.3
227	65	110	-11	-24.7	121	610.09	271.7
228	65	142	-11	7.3	121	53.29	-80.3
229	95	161	19	26.3	361	691.69	499.7
230	65	143	-11	8.3	121	68.89	-91.3
231	85	157	9	22.3	81	497.29	200.7
232	75	119	-1	-14.7	1	216.09	14.7
233	85	135	9	0.3	81	.09	2.7
234	65	89	-11	-45.7	121	2088.49	502.7
235	65	154	-11	19.3	121	372.49	-212.3
236	75	99	-1	-35.7	1	1274.49	35.7
237	75	118	-1	-16.7	1	278.89	16.7
238	75	92	-1	-42.7	1	1823.29	42.7

TABLE VI a (1938)

No.	X	Y	X	Y	X	Y	X
191	85	133	-11	-11.7	131	132.88	133.7
192	88	131	9	26.3	81	99.18	133.7
193	75	141	-1	6.3	1	32.88	-6.3
194	85	131	-11	-2.7	131	10.09	40.7
195	75	113	-1	-23.7	1	815.38	23.7
196	85	137	9	3.3	81	5.38	80.7
197	85	170	-11	-28.3	131	1345.09	-28.3
198	75	137	-11	3.3	1	5.38	-5.3
199	85	113	-11	-21.7	131	470.88	-21.7
200	85	133	-11	24.3	131	590.48	-21.7
201	85	145	9	11.3	81	157.88	101.7
202	85	169	9	24.3	81	1176.48	208.7
203	85	148	9	13.3	81	176.88	119.7
204	85	139	9	4.3	81	18.48	28.7
205	75	144	-1	2.3	1	86.48	-2.3
206	85	131	9	-2.7	81	12.88	-22.3
207	85	133	-11	-2.7	131	7.38	29.7
208	75	138	-1	-6.7	1	44.88	6.7
209	75	149	-1	14.3	1	304.48	-14.3
210	85	154	9	19.3	81	325.48	173.7
211	85	141	-11	6.3	131	29.88	-6.3
212	75	171	-1	26.3	1	1317.88	-26.3
213	75	139	-1	6.3	1	88.09	-6.3
214	75	133	-1	-1.7	1	5.88	1.7
215	85	90	-11	-44.7	131	1998.09	491.7
216	75	141	-1	6.3	1	39.88	-6.3
217	85	149	9	18.3	81	234.09	177.7
218	85	130	9	-4.7	81	82.09	-42.3
219	75	136	-1	1.3	1	1.88	-1.3
220	85	136	-11	1.3	131	1.88	-14.3
221	85	133	9	-13.7	81	161.38	-114.3
222	85	148	9	13.3	81	178.88	119.7
223	75	147	-1	12.3	1	151.38	-12.3
224	85	107	-11	-27.7	131	767.38	204.7
225	85	119	-11	-15.7	131	246.48	173.7
226	85	135	-11	0.3	131	0.9	-2.3
227	85	110	-11	-24.7	131	610.09	271.7
228	85	142	-11	7.3	131	62.38	-80.3
229	85	161	19	26.3	361	991.88	499.7
230	85	143	-11	8.3	131	68.88	-21.3
231	85	137	9	22.3	81	497.38	200.7
232	75	119	-1	-14.7	1	216.09	14.7
233	85	135	9	0.3	81	0.9	2.7
234	85	89	-11	-45.7	131	2088.48	502.7
235	85	154	-11	19.3	131	373.48	-212.3
236	75	99	-1	-35.7	1	1274.48	22.7
237	75	118	-1	-16.7	1	278.88	16.7
238	75	92	-1	-42.7	1	1823.38	42.7

TABLE VI a (1938)

No.	X	Y	x	y	x ²	y ²	xy
239	75	134	- 1	- 0.7	1	.49	.7
239	76.004	134.72			14,287.	103,128.67	8,626.40

Correlating :

$$r = \frac{\sum xy}{\sqrt{\sum x^2} \times \sqrt{\sum y^2}} = \frac{8,626.40}{\sqrt{14,287.} \times \sqrt{103,128.67}}$$

$$r = \frac{8,626.40}{119.53 \times 321.14} = \frac{8,626.40}{38,385.86}$$

$$r = .225$$

TABLE VI a (1958)

No.	X	Y	X	Y	X	Y	X	Y
222	75	154	1	-	1	-	0.7	-
223	76	154	1	-	1	-	0.7	-
224	77	154	1	-	1	-	0.7	-
225	78	154	1	-	1	-	0.7	-
226	79	154	1	-	1	-	0.7	-
227	80	154	1	-	1	-	0.7	-
228	81	154	1	-	1	-	0.7	-
229	82	154	1	-	1	-	0.7	-
230	83	154	1	-	1	-	0.7	-
231	84	154	1	-	1	-	0.7	-
232	85	154	1	-	1	-	0.7	-
233	86	154	1	-	1	-	0.7	-
234	87	154	1	-	1	-	0.7	-
235	88	154	1	-	1	-	0.7	-
236	89	154	1	-	1	-	0.7	-
237	90	154	1	-	1	-	0.7	-
238	91	154	1	-	1	-	0.7	-
239	92	154	1	-	1	-	0.7	-
240	93	154	1	-	1	-	0.7	-
241	94	154	1	-	1	-	0.7	-
242	95	154	1	-	1	-	0.7	-
243	96	154	1	-	1	-	0.7	-
244	97	154	1	-	1	-	0.7	-
245	98	154	1	-	1	-	0.7	-
246	99	154	1	-	1	-	0.7	-
247	100	154	1	-	1	-	0.7	-
248	101	154	1	-	1	-	0.7	-
249	102	154	1	-	1	-	0.7	-
250	103	154	1	-	1	-	0.7	-
251	104	154	1	-	1	-	0.7	-
252	105	154	1	-	1	-	0.7	-
253	106	154	1	-	1	-	0.7	-
254	107	154	1	-	1	-	0.7	-
255	108	154	1	-	1	-	0.7	-
256	109	154	1	-	1	-	0.7	-
257	110	154	1	-	1	-	0.7	-
258	111	154	1	-	1	-	0.7	-
259	112	154	1	-	1	-	0.7	-
260	113	154	1	-	1	-	0.7	-
261	114	154	1	-	1	-	0.7	-
262	115	154	1	-	1	-	0.7	-
263	116	154	1	-	1	-	0.7	-
264	117	154	1	-	1	-	0.7	-
265	118	154	1	-	1	-	0.7	-
266	119	154	1	-	1	-	0.7	-
267	120	154	1	-	1	-	0.7	-
268	121	154	1	-	1	-	0.7	-
269	122	154	1	-	1	-	0.7	-
270	123	154	1	-	1	-	0.7	-
271	124	154	1	-	1	-	0.7	-
272	125	154	1	-	1	-	0.7	-
273	126	154	1	-	1	-	0.7	-
274	127	154	1	-	1	-	0.7	-
275	128	154	1	-	1	-	0.7	-
276	129	154	1	-	1	-	0.7	-
277	130	154	1	-	1	-	0.7	-
278	131	154	1	-	1	-	0.7	-
279	132	154	1	-	1	-	0.7	-
280	133	154	1	-	1	-	0.7	-
281	134	154	1	-	1	-	0.7	-
282	135	154	1	-	1	-	0.7	-
283	136	154	1	-	1	-	0.7	-
284	137	154	1	-	1	-	0.7	-
285	138	154	1	-	1	-	0.7	-
286	139	154	1	-	1	-	0.7	-
287	140	154	1	-	1	-	0.7	-
288	141	154	1	-	1	-	0.7	-
289	142	154	1	-	1	-	0.7	-
290	143	154	1	-	1	-	0.7	-
291	144	154	1	-	1	-	0.7	-
292	145	154	1	-	1	-	0.7	-
293	146	154	1	-	1	-	0.7	-
294	147	154	1	-	1	-	0.7	-
295	148	154	1	-	1	-	0.7	-
296	149	154	1	-	1	-	0.7	-
297	150	154	1	-	1	-	0.7	-
298	151	154	1	-	1	-	0.7	-
299	152	154	1	-	1	-	0.7	-
300	153	154	1	-	1	-	0.7	-

Correlation:

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}} = \frac{14,887.41 \times 103,138.67}{\sqrt{119.53 \times 321.14}} = \frac{1,535,838.8}{\sqrt{38,383.83}} = 0.383$$

Conclusions.

The correlation calculation in the immediately preceding pages gives a value of r of $+ 0.225$, and the probable error for a class of this size would be approximately .04. The coefficient is slightly more than four times its probable error so it can be considered to be valid but is so small a value as to be of no use for the general purpose in mind; i.e. to serve as an indicator of future performance, reliable enough to be used for sectioning purposes, or to indicate the need for special help to enable the student to satisfactorily complete the course.

Consequently, no further correlations of these two sets of data will be attempted.

Conclusions.

The correlation calculation in the immediately preceding pages gives a value of r of $+0.825$, and the probable error for a class of this size would be approximately $.04$. The coefficient is slightly more than four times its probable error so it can be considered to be valid but is so small a value as to be of no use for the general purpose in mind; i.e. to serve as an indicator of future performance, reliable enough to be used for sectioning purposes, or to indicate the need for special help to enable the student to satisfactorily complete the course. Consequently, no further correlations of these two sets of data will be attempted.

Chapter VI.RELATION OF HIGH SCHOOL ALGEBRA GRADES TO
COLLEGE ALGEBRA FINAL GRADES.

At first thought there would seem to be a very close relation between the grades of a class in high school algebra and the grades achieved by the same persons when they take algebra in college. Upon more careful analysis of the surrounding conditions, however, it may be seen that there are many factors which may entirely or partially prevent a particular student from doing the same grade of work in algebra at both high school and college. The quality of work done by the same person is usually better in college either because he has become convinced of the necessity of acquiring this skill as a tool for later use or because he has become interested in it for itself. Otherwise by choice of electives he would have avoided its tedium. This does not necessarily mean that his standing in his class will be the same in both places as in many high school algebra courses the general average of achievement is not high, regardless of the level of ability existing. The wide difference existing between grading systems in various high schools introduces a variable factor even if the course has been of the proper scope and the achievement had been properly graded.

Chapter VI.

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Bearing in mind these sources of variation it will be useful to correlate the grades obtained in algebra in high school with the grades achieved by the same persons in college algebra. It seems entirely possible that despite all of the variables previously mentioned there will exist a rather close relation between the two sets of grades. If the relation existing is as close as the relation between the placement test and the final grade, the high school algebra grades might be used directly for sectioning purposes and permit dropping the algebra placement test entirely.

In the following pages are the tables of correlation calculations for these two sets of data.

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 be useful to correlate the grades obtained in algebra
 in high school with the grades achieved by the same
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 as the relation between the placement test and the final
 grade, the high school algebra grades might be used di-
 rectly for sectioning purposes and permit dropping the
 algebra placement test entirely.

In the following pages are the tables of correlation
 calculations for these two sets of data.

TABLE VII a (1938)

Correlation of High School Algebra Grade and
Algebra Final Grade

No.	X	Y	x	y	x^2	y^2	xy
1	--	Same as	--	--	--	Same as	--
2	75	in	- 4.5	.7	20.25	in	- 3.15
3	85	Table	5.5	- 9.3	30.25	Table	- 51.15
4	50	III a	-29.5	-24.3	870.25	III a	716.85
5	75		- 4.5	10.7	20.25		48.15
6	75		- 4.5	.7	20.25		- 3.15
7	85		5.5	- 9.3	30.25		- 51.15
8	95		15.5	10.7	240.25		165.85
9	75		- 4.5	10.7	20.25		- 48.15
10	85		5.5	-54.3	30.25		-188.65
11	85		5.5	- 9.3	30.25		- 51.15
12	65		-14.5	-24.3	210.25		352.35
13	85		5.5	- 9.3	30.25		- 51.15
14	--		--	----	----		----
15	65		-14.5	-24.3	210.25		352.35
16	85		5.5	10.7	30.25		58.85
17	85		5.5	10.7	30.25		58.85
18	85		5.5	.7	30.25		3.85
19	85		5.5	.7	30.25		3.85
20	75		- 4.5	10.7	20.25		- 48.15
21	75		- 4.5	10.7	20.25		- 48.15
22	85		5.5	20.7	30.25		113.85
23	75		-4.5	-24.3	20.25		109.35
24	95		15.5	20.7	240.25		320.85
25	75		- 4.5	.7	20.25		- 3.15
26	95		15.5	10.7	240.25		165.85
27	75		- 4.5	10.7	20.25		- 48.15
28	75		- 4.5	.7	20.25		- 3.15
29	95		15.5	10.7	240.25		165.85
30	65		-14.5	-24.3	210.25		352.35
31	75		- 4.5	.7	20.25		- 3.15
32	85		5.5	- 9.3	30.25		- 51.15
33	75		- 4.5	.7	20.25		- 3.15
34	75		- 4.5	10.7	20.25		- 48.15
35	75		- 4.5	- 9.3	20.25		41.85
36	75		- 4.5	- 9.3	20.25		41.85
37	75		- 4.5	.7	20.25		- 3.15
38	95		15.5	20.7	240.25		320.85
39	95		15.5	20.7	240.25		320.85
40	85		5.5	20.7	30.25		113.85
41	85		5.5	.7	30.25		3.85
42	75		- 4.5	.7	20.25		- 3.15
43	85		5.5	10.7	30.25		58.85
44	75		- 4.5	.7	20.25		- 3.15
45	95		15.5	- 9.3	240.25		-144.15

TABLE VII a (1939)

Correlation of High School Algebra Grade and
Algebra Final Grade

No.	X	Y	X	Y	X	Y	X	Y
1	--	Same as	--	--	--	Same as	--	--
2	75	in	30.25	7	4.5	in	30.25	3.15
3	85	Table	30.25	9.3	5.5	Table	30.25	5.15
4	80	III a	30.25	84.3	30.25	III a	30.25	718.85
5	75		30.25	10.7	4.5		30.25	48.15
6	75		30.25	7	4.5		30.25	3.15
7	85		30.25	9.3	5.5		30.25	5.15
8	35		340.25	10.7	15.5		340.25	168.85
9	75		30.25	10.7	4.5		30.25	48.15
10	85		30.25	84.3	30.25		30.25	718.85
11	85		30.25	9.3	5.5		30.25	5.15
12	35		310.25	84.3	14.5		310.25	368.85
13	35		30.25	9.3	5.5		30.25	5.15
14	--		--	--	--		--	--
15	35		310.25	84.3	14.5		310.25	368.85
16	35		30.25	10.7	5.5		30.25	58.85
17	35		30.25	10.7	5.5		30.25	58.85
18	35		30.25	7	5.5		30.25	3.85
19	35		30.25	7	5.5		30.25	3.85
20	75		30.25	10.7	4.5		30.25	48.15
21	75		30.25	10.7	4.5		30.25	48.15
22	35		30.25	80.7	5.5		30.25	118.85
23	75		30.25	84.3	4.5		30.25	108.85
24	35		340.25	80.7	15.5		340.25	380.85
25	75		30.25	7	4.5		30.25	3.15
26	35		340.25	10.7	15.5		340.25	168.85
27	75		30.25	10.7	4.5		30.25	48.15
28	75		30.25	7	4.5		30.25	3.15
29	35		340.25	10.7	15.5		340.25	168.85
30	35		310.25	84.3	14.5		310.25	368.85
31	75		30.25	7	4.5		30.25	3.15
32	35		30.25	9.3	5.5		30.25	5.15
33	75		30.25	7	4.5		30.25	3.15
34	75		30.25	10.7	4.5		30.25	48.15
35	75		30.25	9.3	4.5		30.25	41.85
36	75		30.25	9.3	4.5		30.25	41.85
37	75		30.25	7	4.5		30.25	3.15
38	35		340.25	80.7	15.5		340.25	380.85
39	35		340.25	80.7	15.5		340.25	380.85
40	35		30.25	80.7	5.5		30.25	118.85
41	35		30.25	7	5.5		30.25	3.85
42	75		30.25	7	4.5		30.25	3.15
43	35		30.25	10.7	5.5		30.25	58.85
44	75		30.25	7	4.5		30.25	3.15
45	35		340.25	9.3	15.5		340.25	148.15

TABLE VII a (1938)

No.	X	y	x	y	x ²	y ²	xy
46	95		15.5	20.7	240.25		320.85
47	65		-14.5	20.7	210.25		-300.15
48	75		- 4.5	-24.3	20.25		109.35
49	75		- 4.5	- 9.3	20.25		41.85
50	--		---	---	---		---
51	85		5.5	.7	30.25		3.85
52	75		- 4.5	- 9.3	20.25		41.85
53	85		5.5	20.7	30.25		113.85
54	85		5.5	10.7	30.25		58.85
55	--		---	---	---		---
56	75		- 4.5	.7	20.25		- 3.15
57	75		- 4.5	.7	20.25		- 3.15
58	85		5.5	20.7	30.25		113.85
59	85		5.5	20.7	30.25		113.85
60	75		- 4.5	- 9.3	20.25		41.85
61	75		- 4.5	- 9.3	20.25		41.85
62	95		15.5	.7	240.25		10.85
63	85		5.5	- 9.3	30.25		41.15
64	75		- 4.5	- 9.3	20.25		41.85
65	95		15.5	20.7	240.25		320.85
66	85		5.5	20.7	30.25		113.85
67	85		5.5	10.7	30.25		58.85
68	85		5.5	.7	30.25		3.85
69	95		15.5	20.7	240.25		320.85
70	65		-14.5	.7	210.25		- 10.15
71	85		5.5	.7	30.25		3.85
72	65		-14.5	-24.3	210.25		352.35
73	--		---	---	---		---
74	95		15.5	20.7	240.25		320.85
75	65		-14.5	.7	210.25		- 10.15
76	75		- 4.5	.7	20.25		- 3.15
77	95		15.5	10.7	240.25		165.85
78	85		5.5	20.7	30.25		113.85
79	85		5.5	.7	30.25		10.85
80	75		- 4.5	10.7	20.25		- 48.15
81	85		5.5	- 9.3	30.25		- 51.15
82	65		-14.5	.7	210.25		- 10.15
83	85		5.5	10.7	30.25		58.85
84	75		- 4.5	.7	20.25		- 10.15
85	65		-14.5	- 9.3	210.25		134.85
86	85		5.5	20.7	30.25		113.85
87	65		- 4.5	-24.3	20.25		109.35
88	85		5.5	.7	30.25		3.85
89	75		- 4.5	10.7	20.25		- 48.15
90	75		- 4.5	.7	20.25		- 3.15
91	75		- 4.5	10.7	20.25		- 48.15
92	75		- 4.5	- 9.3	20.25		41.85
93	65		-14.5	-24.3	210.25		352.35

TABLE VII a (1938)

No.	X	Y	x	y	x ²	y ²	xy
94	85		5.5	10.7	30.25		58.85
95	--		---	---	---		---
96	65		-14.5	.7	210.25		- 10.15
97	75		- 4.5	10.7	20.25		- 48.15
98	85		5.5	10.7	30.25		58.85
99	75		- 4.5	- 9.3	20.25		41.85
100	--		--	---	---		---
101	95		15.5	20.7	240.25		320.85
102	85		5.5	10.7	30.25		58.85
103	75		- 4.5	-34.3	20.25		154.35
104	--		--	---	---		---
105	85		5.5	- 9.3	30.25		- 51.15
106	75		- 4.5	- 9.3	20.25		41.85
107	75		- 4.5	.7	20.25		- 3.15
108	75		- 4.5	10.7	20.25		- 48.15
109	--		---	---	---		---
110	75		- 4.5	-24.3	20.25		109.35
111	75		- 4.5	10.7	20.25		- 48.15
112	75		- 4.5	- 9.3	20.25		41.85
113	95		15.5	10.7	240.25		165.85
114	85		5.5	20.7	30.25		113.85
115	75		- 4.5	- 9.3	20.25		41.85
116	65		-14.5	-34.3	210.25		497.35
117	85		5.5	.7	30.25		3.85
118	85		5.5	- 9.3	30.25		- 51.15
119	85		5.5	20.7	30.25		113.85
120	75		- 4.5	.7	20.25		- 3.15
121	75		- 4.5	- 9.3	20.25		41.85
122	85		5.5	20.7	30.25		113.85
123	65		-14.5	-24.3	210.25		352.35
124	95		15.5	20.7	240.25		320.85
125	85		5.5	10.7	30.25		58.85
126	75		- 4.5	.7	20.25		- 3.15
127	65		-14.5	- 9.3	210.25		134.85
128	95		15.5	20.7	240.25		320.85
129	85		5.5	10.7	30.25		58.85
130	85		5.5	10.7	30.25		58.85
131	85		5.5	20.7	30.25		113.85
132	85		5.5	.7	30.25		3.85
133	95		15.5	20.7	240.25		320.85
134	85		5.5	.7	30.25		3.85
135	--		---	---	---		---
136	85		5.5	- 9.3	30.25		- 51.15
137	75		- 4.5	- 9.4	20.25		41.85
138	85		5.5	10.7	30.25		58.85
139	75		- 4.5	-34.3	20.25		154.35
140	75		- 4.5	20.7	20.25		- 93.15
141	75		- 4.5	10.7	20.25		- 48.15

TABLE VII B (1988)

No.	X	Y	X	Y	X _S	Y _S	KY
94	88		8.8	10.7	88.88		88.88
95	--		---	---	---		---
96	88		-14.8	7.	88.018		-10.18
97	78		-4.8	10.7	80.88		-48.18
98	88		8.8	10.7	88.88		88.88
99	78		-4.8	-9.8	80.88		41.88
100	--		---	---	---		---
101	88		18.8	80.7	88.088		88.088
102	88		8.8	10.7	88.88		88.88
103	78		-4.8	-34.8	80.88		184.88
104	--		---	---	---		---
105	88		8.8	-9.8	80.88		-81.18
106	78		-4.8	-9.8	80.88		41.88
107	78		-4.8	7.	80.88		-3.18
108	78		-4.8	10.7	80.88		-48.18
109	--		---	---	---		---
110	78		-4.8	-34.8	80.88		184.88
111	78		-4.8	10.7	80.88		-48.18
112	78		-4.8	-9.8	80.88		41.88
113	88		18.8	10.7	88.088		188.88
114	88		8.8	80.7	88.88		118.88
115	78		-4.8	-9.8	80.88		41.88
116	88		-14.8	-34.8	88.088		487.88
117	88		8.8	7.	80.88		8.88
118	88		8.8	-9.8	80.88		-81.18
119	88		8.8	80.7	88.88		118.88
120	78		-4.8	7.	80.88		-3.18
121	78		-4.8	-9.8	80.88		41.88
122	88		8.8	80.7	88.88		118.88
123	88		-14.8	-34.8	88.088		888.88
124	88		18.8	80.7	88.088		880.88
125	88		8.8	10.7	88.88		88.88
126	78		-4.8	7.	80.88		-3.18
127	88		-14.8	-9.8	88.088		184.88
128	88		18.8	80.7	88.088		880.88
129	88		8.8	10.7	88.88		88.88
130	88		8.8	10.7	88.88		88.88
131	88		8.8	80.7	88.88		118.88
132	88		8.8	7.	80.88		8.88
133	88		18.8	80.7	88.088		880.88
134	88		8.8	7.	80.88		8.88
135	--		---	---	---		---
136	88		8.8	-9.8	80.88		-81.18
137	78		-4.8	-9.8	80.88		41.88
138	88		8.8	10.7	88.88		88.88
139	78		-4.8	-34.8	80.88		184.88
140	78		-4.8	80.7	80.88		-88.18
141	78		-4.8	10.7	80.88		-48.18

TABLE VII a (1938)

No.	X	Y	x	y	x ²	y ²	xy
142	95		15.5	20.7	240.25		320.85
143	75		- 4.5	-24.3	20.25		109.35
144	85		5.5	.7	30.25		3.85
145	85		5.5	20.7	30.25		113.85
146	75		- 4.5	- 9.3	20.25		41.85
147	85		5.5	- 9.3	30.25		- 51.85
148	95		15.5	20.7	240.25		320.85
149	75		- 4.5	- 9.3	20.25		41.85
150	85		5.5	.7	30.25		3.85
151	85		5.5	10.7	30.25		58.85
152	75		- 4.5	- 9.3	20.25		41.85
153	75		- 4.5	.7	20.25		- 3.85
154	75		- 4.5	.7	20.25		- 3.85
155	95		15.5	20.7	240.25		314.65
156	75		- 4.5	-24.3	20.25		154.35
157	85		5.5	10.7	30.25		58.85
158	75		- 4.5	10.7	20.25		- 48.15
159	85		5.5	10.7	30.25		58.85
160	85		5.5	- 9.3	30.25		- 51.15
161	65		-14.5	- 9.3	210.25		134.85
162	65		-14.5	-24.3	210.25		352.35
163	65		-14.5	- 9.3	210.25		134.85
164	75		-4.5	- 9.3	20.25		41.85
165	75		- 4.5	10.7	20.25		- 48.15
166	75		- 4.5	.7	20.25		3.15
167	85		5.5	- 9.3	30.25		- 51.15
168	65		-14.5	-24.3	210.25		352.35
169	65		-14.5	- 9.3	210.25		134.85
170	75		- 4.5	-24.3	20.25		109.35
171	75		- 4.5	10.7	20.25		- 48.15
172	65		-14.5	- 9.3	210.25		134.85
173	65		-14.5	.7	210.25		- 10.15
174	85		5.5	.7	30.25		3.85
175	85		5.5	.7	30.25		3.85
176	65		-14.5	-24.3	210.25		352.35
177	75		- 4.5	10.7	20.25		- 48.15
178	85		5.5	10.7	30.25		58.85
179	85		5.5	- 9.3	30.25		- 51.15
180	85		5.5	.7	30.25		3.85
181	75		- 4.5	.7	20.25		- 3.15
182	75		- 4.5	10.7	20.25		- 48.15
183	75		- 4.5	-24.3	20.25		154.35
184	85		5.5	.7	30.25		3.85
185	85		5.5	10.7	30.25		58.85
186	75		- 4.5	.7	20.25		- 3.15
187	85		5.5	10.7	30.25		58.85
188	--		--	---	--		----
189	85		5.5	20.7	30.25		113.85

TABLE VII a (1928)

No.	X	Y	x	y	X	Y
142	35		13.5	30.7	340.35	38.035
143	35	- 4.5	- 34.3	30.35	33.03	38.001
144	35	5.5	7.	30.35	33.03	38.3
145	35	5.5	30.7	30.35	33.03	38.311
146	35	- 4.5	- 3.3	30.35	33.03	38.14
147	35	5.5	- 3.3	30.35	33.03	38.13 -
148	35	13.5	30.7	340.35	33.035	38.035
149	35	- 4.5	- 3.3	30.35	33.03	38.14
150	35	5.5	7.	30.35	33.03	38.3
151	35	5.5	10.7	30.35	33.03	38.34
152	35	- 4.5	- 3.3	30.35	33.03	38.14
153	35	- 4.5	7.	30.35	33.03	38.3 -
154	35	- 4.5	7.	30.35	33.03	38.3 -
155	35	13.5	30.7	340.35	33.035	38.314
156	35	- 4.5	- 34.3	30.35	33.03	38.4
157	35	5.5	10.7	30.35	33.03	38.34
158	35	- 4.5	10.7	30.35	33.03	38.14 -
159	35	5.5	10.7	30.35	33.03	38.34
160	35	5.5	- 3.3	30.35	33.03	38.14 -
161	35	-14.5	- 3.3	30.35	33.03	38.44
162	35	-14.5	- 34.3	30.35	33.03	38.34
163	35	-14.5	- 3.3	30.35	33.03	38.44
164	35	- 4.5	- 3.3	30.35	33.03	38.14
165	35	- 4.5	10.7	30.35	33.03	38.14 -
166	35	- 4.5	7.	30.35	33.03	38.14
167	35	5.5	- 3.3	30.35	33.03	38.14 -
168	35	-14.5	- 34.3	30.35	33.03	38.34
169	35	-14.5	- 3.3	30.35	33.03	38.44
170	35	- 4.5	- 34.3	30.35	33.03	38.34
171	35	- 4.5	10.7	30.35	33.03	38.14 -
172	35	-14.5	- 3.3	30.35	33.03	38.44
173	35	-14.5	7.	30.35	33.03	38.14 -
174	35	5.5	7.	30.35	33.03	38.3
175	35	5.5	5.5	30.35	33.03	38.3
176	35	-14.5	- 34.3	30.35	33.03	38.34
177	35	- 4.5	10.7	30.35	33.03	38.14 -
178	35	5.5	10.7	30.35	33.03	38.34
179	35	5.5	- 3.3	30.35	33.03	38.14 -
180	35	5.5	7.	30.35	33.03	38.3
181	35	- 4.5	7.	30.35	33.03	38.14 -
182	35	- 4.5	10.7	30.35	33.03	38.14 -
183	35	- 4.5	- 34.3	30.35	33.03	38.44
184	35	5.5	7.	30.35	33.03	38.3
185	35	5.5	10.7	30.35	33.03	38.34
186	35	- 4.5	7.	30.35	33.03	38.14 -
187	35	5.5	10.7	30.35	33.03	38.34
188	35	-	-	-	-	-
189	35	5.5	30.7	30.35	33.03	38.311

TABLE VII a (1938)

No.	X	Y	x	y	x ²	y ²	xy
190	65		-14.5	- 9.3	210.25		134.85
191	75		- 4.5	- 9.3	20.25		41.85
192	85		5.5	10.7	30.25		58.85
193	85		5.5	10.7	30.25		58.85
194	75		- 4.5	- 9.3	20.25		41.85
195	75		- 4.5	10.7	20.25		- 48.15
196	85		5.5	10.7	30.25		58.85
197	75		- 4.5	.7	20.25		- 3.15
198	65		-14.5	-34.3	210.25		497.35
199	75		- 4.5	.7	20.25		- 3.15
200	75		- 4.5	- 9.3	20.25		41.85
201	85		5.5	10.7	30.25		58.85
202	85		5.5	20.7	30.25		113.85
203	85		5.5	20.7	30.25		113.85
204	85		5.5	- 9.3	30.25		- 51.15
205	85		5.5	10.7	30.25		58.85
206	85		5.5	10.7	30.25		58.85
207	--		--	---	---		---
208	75		- 4.5	.7	20.25		- 3.15
209	85		5.5	- 9.3	30.25		- 51.15
210	95		15.5	20.7	240.25		320.85
211	75		-14.5	- 9.3	20.25		41.85
212	85		5.5	10.7	30.25		58.85
213	75		- 4.5	.7	20.25		- 3.15
214	75		- 4.5	- 9.3	20.25		41.85
215	75		- 4.5	- 9.3	20.25		41.85
216	75		- 4.5	.7	20.25		- 3.15
217	95		15.5	20.7	240.25		320.85
218	85		5.5	.7	30.25		3.85
219	75		- 4.5	- 9.3	20.25		41.85
220	75		- 4.5	- 9.3	20.25		41.85
221	85		5.5	.7	30.25		3.85
222	85		5.5	- 9.3	30.25		- 51.15
223	65		-14.5	.7	210.25		- 10.15
224	75		- 4.5	- 9.3	20.25		41.85
225	65		-14.5	- 9.3	210.25		134.85
226	65		-14.5	-10.7	210.25		-155.15
227	75		- 4.5	-24.3	20.25		109.35
228	75		- 4.5	-24.3	20.25		109.35
229	95		15.5	10.7	240.25		165.85
230	75		- 4.5	20.7	20.25		- 93.15
231	85		5.5	10.7	30.25		58.85
232	85		5.5	.7	30.25		3.85
233	75		- 4.5	- 9.3	20.25		41.85
234	75		- 4.5	-34.3	20.25		154.35
235	75		- 4.5	10.7	20.25		- 48.15
236	85		5.5	.7	30.25		3.85

TABLE VII a (1938)

No.	X	Y	X	Y	X	Y
190	85	-14.5	-9.3	80.35	134.85	
191	75	-4.5	-9.3	80.35	41.85	
192	85	5.5	10.7	80.35	58.85	
193	85	5.5	10.7	80.35	58.85	
194	75	-4.5	-9.3	80.35	41.85	
195	75	-4.5	10.7	80.35	-46.15	
196	85	5.5	10.7	80.35	58.85	
197	75	-4.5	7.	80.35	3.15	
198	85	-14.5	-24.3	80.35	997.35	
199	75	-4.5	7.	80.35	3.15	
200	75	-4.5	-9.3	80.35	41.85	
201	85	5.5	10.7	80.35	58.85	
202	85	5.5	80.7	80.35	113.85	
203	85	5.5	80.7	80.35	113.85	
204	85	5.5	-9.3	80.35	-51.15	
205	85	5.5	10.7	80.35	58.85	
206	85	5.5	10.7	80.35	58.85	
207	--	--	--	--	--	
208	75	-4.5	7.	80.35	3.15	
209	85	5.5	-9.3	80.35	-51.15	
210	95	15.5	20.7	240.35	230.85	
211	75	-4.5	-9.3	80.35	41.85	
212	85	5.5	10.7	80.35	58.85	
213	75	-4.5	7.	80.35	3.15	
214	75	-4.5	-9.3	80.35	41.85	
215	75	-4.5	-9.3	80.35	41.85	
216	75	-4.5	7.	80.35	3.15	
217	95	15.5	20.7	240.35	230.85	
218	85	5.5	7.	80.35	3.85	
219	75	-4.5	-9.3	80.35	41.85	
220	75	-4.5	-9.3	80.35	41.85	
221	85	5.5	7.	80.35	3.85	
222	85	5.5	-9.3	80.35	-51.15	
223	85	-14.5	7.	80.35	-10.15	
224	75	-4.5	-9.3	80.35	41.85	
225	85	-14.5	-9.3	80.35	134.85	
226	85	-14.5	-10.7	80.35	-134.15	
227	75	-4.5	-24.3	80.35	107.35	
228	75	-4.5	-24.3	80.35	107.35	
229	95	15.5	10.7	240.35	165.85	
230	75	-4.5	20.7	80.35	-93.15	
231	85	5.5	10.7	80.35	58.85	
232	85	5.5	7.	80.35	3.85	
233	75	-4.5	-9.3	80.35	41.85	
234	75	-4.5	-24.3	80.35	134.35	
235	75	-4.5	10.7	80.35	-48.15	
236	85	5.5	7.	80.35	3.85	

TABLE VII a (1938)

No.	X	Y	x	y	x ²	y ²	xy
237	85		5.5	-24.3	30.25		-133.65
238	75		-4.5	-24.3	20.25		109.35
239	85		5.5	.7	30.25		3.85
227	175	50			16,706.75	47,299.72	16,078.88
	79.5	74.3					

Correlating :

$$r = \frac{\sum xy}{\sqrt{\sum x^2} \times \sqrt{\sum y^2}} = \frac{16,078.88}{\sqrt{16,706.75} \times \sqrt{47,299.72}}$$

$$= \frac{16,078.88}{129.25 \times 217.48} = \frac{16,078.88}{28,109.29}$$

$$= .57$$

TABLE VII (1938)

No.	X	Y	X	Y	X	Y
237	88	8.3	88.08	8.38	88.08	8.38
238	75	8.3	88.08	8.38	88.08	8.38
239	88	8.3	88.08	8.38	88.08	8.38
237 17850	73.5	74.3	10,708.76	47,223.48	10,708.76	47,223.48

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}} = \frac{10,093.88}{\sqrt{16,000.51 \times 16,000.51}}$$

$$r = \frac{10,093.88}{\sqrt{16,000.51 \times 16,000.51}} = \frac{10,093.88}{16,000.51}$$

$$r = \frac{10,093.88}{16,000.51} = 0.63$$

= .63

TABLE VII b (1937)

Correlation of High School Algebra and Algebra Final Grades

No.	X	Y	x	y	x ²	y ²	xy
1	65	Same as	-15.42	- 9.7	237.78	Same as	149.57
2	65	Table	-15.42	.3	237.78	Table	- 4.63
3	65	III b	-15.42	.3	237.78	III b	- 4.63
4	95		14.58	20.3	212.58		295.57
5	65		-15.42	.3	237.78		- 4.63
6	65		-15.42	10.3	237.78		-158.83
7	65		-15.42	-24.7	237.78		380.87
8	85		4.58	.3	20.98		1.37
9	75		- 5.42	10.3	29.38		- 55.83
10	65		-15.42	-39.7	237.78		612.17
11	75		-25.42	.3	29.38		- 1.63
12	65		-15.42	.3	237.78		- 4.63
13	75		- 5.42	10.3	29.38		- 55.83
14	85		4.58	- 9.7	20.98		- 44.43
15	85		4.58	10.3	20.98		47.17
16	65		-15.42	.3	237.78		- 4.63
17	85		4.58	.3	20.98		1.37
18	95		14.58	10.3	212.58		150.17
19	75		- 5.42	.3	29.38		- 1.63
20	85		4.58	- 9.7	20.98		- 44.43
21	85		4.58	20.3	20.98		98.46
22	85		4.58	10.3	20.98		47.17
23	95		14.58	10.3	212.58		150.17
24	85		4.58	- 9.7	20.98		- 44.43
25	75		- 5.42	.3	29.38		- 1.63
26	85		4.58	10.3	20.98		47.17
27	65		-15.42	-29.7	237.78		380.87
28	65		-15.42	10.3	237.78		-158.83
29	65		-15.42	-24.7	237.78		380.87
30	75		- 5.42	10.3	29.38		- 55.83
31	65		-15.42	-24.7	237.78		380.87
32	85		4.58	10.3	20.98		47.17
33	75		- 5.42	.3	29.38		- 1.63
34	75		- 5.42	10.3	29.38		- 55.83
35	95		14.58	10.3	212.58		150.17
36	65		-15.42	- 9.7	237.78		149.57
37	65		-15.42	10.3	237.78		-158.83
38	75		- 5.42	- 9.7	29.38		52.57
39	65		-15.42	.3	237.78		- 4.63
40	65		-15.42	.3	237.78		- 4.63
41	85		4.58	- 9.7	20.98		- 44.43
42	65		-15.42	.3	237.78		- 4.63
43	65		-15.42	10.3	237.78		-158.83
44	85		4.58	10.3	20.98		47.17
45	95		14.58	10.3	212.58		150.17
46	85		4.58	.3	20.98		1.37

TABLE VII b (1937)

Correlation of High School Algebra and Algebra Final Grades

No.	X	Y	X	Y	X	Y	X	Y
1	85	Same as	85	- 9.7	85	85	85	85
2	85	Table	85	8	85	85	85	85
3	85	Table	85	8	85	85	85	85
4	85	Table	85	80.3	85	85	85	85
5	85	Table	85	8	85	85	85	85
6	85	Table	85	10.4	85	85	85	85
7	85	Table	85	-24.7	85	85	85	85
8	85	Table	85	8	85	85	85	85
9	85	Table	85	10.3	85	85	85	85
10	85	Table	85	-24.7	85	85	85	85
11	85	Table	85	8	85	85	85	85
12	85	Table	85	8	85	85	85	85
13	85	Table	85	10.3	85	85	85	85
14	85	Table	85	- 9.7	85	85	85	85
15	85	Table	85	10.3	85	85	85	85
16	85	Table	85	8	85	85	85	85
17	85	Table	85	8	85	85	85	85
18	85	Table	85	10.3	85	85	85	85
19	85	Table	85	8	85	85	85	85
20	85	Table	85	- 9.7	85	85	85	85
21	85	Table	85	80.3	85	85	85	85
22	85	Table	85	10.3	85	85	85	85
23	85	Table	85	10.3	85	85	85	85
24	85	Table	85	- 9.7	85	85	85	85
25	85	Table	85	8	85	85	85	85
26	85	Table	85	10.3	85	85	85	85
27	85	Table	85	-24.7	85	85	85	85
28	85	Table	85	10.3	85	85	85	85
29	85	Table	85	-24.7	85	85	85	85
30	85	Table	85	10.3	85	85	85	85
31	85	Table	85	-24.7	85	85	85	85
32	85	Table	85	10.3	85	85	85	85
33	85	Table	85	8	85	85	85	85
34	85	Table	85	10.3	85	85	85	85
35	85	Table	85	10.3	85	85	85	85
36	85	Table	85	- 9.7	85	85	85	85
37	85	Table	85	10.3	85	85	85	85
38	85	Table	85	- 9.7	85	85	85	85
39	85	Table	85	8	85	85	85	85
40	85	Table	85	8	85	85	85	85
41	85	Table	85	- 9.7	85	85	85	85
42	85	Table	85	8	85	85	85	85
43	85	Table	85	10.3	85	85	85	85
44	85	Table	85	10.3	85	85	85	85
45	85	Table	85	10.3	85	85	85	85
46	85	Table	85	8	85	85	85	85

TABLE VII b (1937)

No.	X	Y	x	y	x ²	y ²	xy
47	65	Same as	-15.42	- 9.7	237.78	Same as	149.57
48	95	III b	14.58	- 9.7	212.58	III b	-141.43
49	65		-15.42	- 9.7	237.78		149.57
50	65		-15.42	- 9.7	237.78		149.57
51	--		---	---	---		---
52	85		4.58	20.3	20.98		98.46
53	85		4.58	- 9.7	20.98		- 44.43
54	65		-15.42	-24.7	237.78		380.87
55	65		-15.42	- 9.7	237.78		149.57
56	65		-15.42	20.3	237.78		-313.03
57	65		-15.42	10.3	237.78		-158.83
58	65		-15.42	10.3	237.78		-158.83
59	85		4.58	.3	20.98		1.37
60	65		-15.42	-24.7	237.78		380.87
61	85		4.58	10.3	20.98		47.17
62	85		4.58	10.3	20.98		47.17
63	65		-15.42	10.3	237.78		-158.83
64	85		4.58	10.3	20.98		47.17
65	--		---	---	---		---
66	65		-15.42	- 9.7	237.78		149.57
67	95		14.58	20.3	212.58		295.57
68	65		-15.42	.3	237.78		- 4.63
69	85		4.58	- 9.7	20.98		- 44.43
70	85		4.58	10.3	20.98		47.17
71	85		4.58	-24.7	20.98		-113.13
72	75		- 5.42	20.3	29.38		-110.03
73	85		4.58	- 9.7	20.98		- 44.43
74	85		4.58	.3	20.98		1.37
75	85		4.58	10.3	20.98		47.17
76	85		4.58	.3	20.98		1.37
77	65		-15.42	- 9.7	237.78		149.97
78	95		14.58	.3	212.58		4.37
79	85		4.58	.3	20.98		1.37
80	65		-15.42	- 9.7	237.78		149.57
81	65		-15.42	- 9.7	237.78		149.57
82	65		-15.42	- 9.7	237.78		149.57
83	85		4.58	10.3	20.98		47.17
84	65		-15.42	- 9.7	237.78		149.57
85	75		- 5.42	20.3	29.38		-110.03
86	85		4.58	10.3	20.98		47.17
87	65		-15.42	20.3	237.78		-313.03
88	95		14.58	.3	212.58		4.37
89	75		- 5.42	-24.7	29.38		133.87
90	75		- 5.42	.3	29.38		- 1.63
91	65		-15.42	10.3	237.78		-158.83
92	65		-15.42	-39.7	237.78		612.17
93	85		4.58	10.3	20.98		47.17
94	85		4.58	- 9.7	20.98		- 44.43

TABLE VII b (1937)

No.	X	Y	X	Y	X	Y	X	Y
47	88	15.42	-24.7	80.98	88	15.42	-24.7	80.98
48	98	14.58	-24.7	80.98	98	14.58	-24.7	80.98
49	88	15.42	-24.7	80.98	88	15.42	-24.7	80.98
50	88	15.42	-24.7	80.98	88	15.42	-24.7	80.98
51	--	--	--	--	--	--	--	--
52	88	4.58	-24.7	80.98	88	4.58	-24.7	80.98
53	88	4.58	-24.7	80.98	88	4.58	-24.7	80.98
54	88	-15.42	-24.7	80.98	88	-15.42	-24.7	80.98
55	88	-15.42	-24.7	80.98	88	-15.42	-24.7	80.98
56	88	-15.42	-24.7	80.98	88	-15.42	-24.7	80.98
57	88	-15.42	-24.7	80.98	88	-15.42	-24.7	80.98
58	88	-15.42	-24.7	80.98	88	-15.42	-24.7	80.98
59	88	4.58	-24.7	80.98	88	4.58	-24.7	80.98
60	88	-15.42	-24.7	80.98	88	-15.42	-24.7	80.98
61	88	4.58	-24.7	80.98	88	4.58	-24.7	80.98
62	88	4.58	-24.7	80.98	88	4.58	-24.7	80.98
63	88	-15.42	-24.7	80.98	88	-15.42	-24.7	80.98
64	88	4.58	-24.7	80.98	88	4.58	-24.7	80.98
65	--	--	--	--	--	--	--	--
66	88	-15.42	-24.7	80.98	88	-15.42	-24.7	80.98
67	98	14.58	-24.7	80.98	98	14.58	-24.7	80.98
68	88	-15.42	-24.7	80.98	88	-15.42	-24.7	80.98
69	88	4.58	-24.7	80.98	88	4.58	-24.7	80.98
70	88	4.58	-24.7	80.98	88	4.58	-24.7	80.98
71	88	4.58	-24.7	80.98	88	4.58	-24.7	80.98
72	78	-5.42	-24.7	80.98	78	-5.42	-24.7	80.98
73	88	4.58	-24.7	80.98	88	4.58	-24.7	80.98
74	88	4.58	-24.7	80.98	88	4.58	-24.7	80.98
75	88	4.58	-24.7	80.98	88	4.58	-24.7	80.98
76	88	4.58	-24.7	80.98	88	4.58	-24.7	80.98
77	88	-15.42	-24.7	80.98	88	-15.42	-24.7	80.98
78	98	14.58	-24.7	80.98	98	14.58	-24.7	80.98
79	88	4.58	-24.7	80.98	88	4.58	-24.7	80.98
80	88	-15.42	-24.7	80.98	88	-15.42	-24.7	80.98
81	88	-15.42	-24.7	80.98	88	-15.42	-24.7	80.98
82	88	-15.42	-24.7	80.98	88	-15.42	-24.7	80.98
83	88	4.58	-24.7	80.98	88	4.58	-24.7	80.98
84	88	-15.42	-24.7	80.98	88	-15.42	-24.7	80.98
85	78	-5.42	-24.7	80.98	78	-5.42	-24.7	80.98
86	88	4.58	-24.7	80.98	88	4.58	-24.7	80.98
87	88	-15.42	-24.7	80.98	88	-15.42	-24.7	80.98
88	98	14.58	-24.7	80.98	98	14.58	-24.7	80.98
89	78	-5.42	-24.7	80.98	78	-5.42	-24.7	80.98
90	78	-5.42	-24.7	80.98	78	-5.42	-24.7	80.98
91	88	-15.42	-24.7	80.98	88	-15.42	-24.7	80.98
92	88	-15.42	-24.7	80.98	88	-15.42	-24.7	80.98
93	88	4.58	-24.7	80.98	88	4.58	-24.7	80.98
94	88	4.58	-24.7	80.98	88	4.58	-24.7	80.98

Y

X

Y

X

Y

X

No.

X

Same as
III b

149.57
-141.42
149.57
149.57

88.48
-44.42
88.48
149.57
149.57
-212.03
-188.83
-158.83
1.37
88.48
47.17
47.17
-158.83
47.17

149.57
88.48
-44.42
-44.42
47.17
-112.12
-110.03
-44.42
1.37
47.17
1.37
149.57
4.37
1.37
149.57
149.57
47.17
149.57
-110.03
47.17
-212.03
4.37
132.87
-1.62
-158.83
818.17
47.17
-44.42

TABLE VII b (1937)

No.	X	Y	x	y	x ²	y ²	xy
95	65	Same as	-15.42	20.3	237.78	Same as	-313.03
96	95	III b	14.58	.3	212.58	III b	4.37
97	85		4.58	9.7	20.98		- 44.43
98	85		4.58	10.3	20.98		47.17
99	75		- 5.42	.3	29.38		- 1.63
100	65		-15.42	20.3	237.78		-313.03
101	65		-15.42	.3	237.78		- 4.63
102	75		- 5.42	10.3	29.38		- 55.83
103	75		- 5.42	20.3	29.38		-110.03
104	95		14.58	.3	212.58		4.37
105	65		-15.42	10.3	237.78		-158.83
106	65		-15.42	10.3	237.78		-158.83
107	65		-15.42	- 9.7	237.78		149.57
108	85		4.58	20.3	20.98		98.46
109	85		4.58	- 9.7	20.98		- 44.43
110	85		4.58	- 9.7	20.98		- 44.43
111	85		4.58	10.3	20.98		47.17
112	75		- 5.42	.3	29.38		- 1.63
113	65		-15.42	- 9.7	237.78		149.57
114	95		14.58	20.3	212.58		295.57
115	75		- 5.42	10.3	29.38		- 55.83
116	75		- 5.42	.3	29.38		- 1.63
117	65		-15.42	- 9.7	237.78		149.57
118	85		4.58	-24.7	20.98		-113.13
119	75		- 5.42	20.3	29.38		-110.03
120	95		14.58	.3	212.58		4.37
121	75		- 5.42	- 9.7	29.38		52.57
122	65		-15.42	-39.7	237.78		612.17
123	65		-15.42	.3	237.78		- 4.63
124	85		4.58	10.3	20.98		47.17
125	95		14.58	- 9.7	212.58		-141.43
126	75		- 5.42	10.3	29.38		- 55.83
127	85		4.58	10.3	20.98		47.17
128	85		4.58	10.3	20.98		47.17
129	75		- 5.42	10.3	29.38		- 55.83
130	85		4.58	10.3	20.98		47.17
131	85		4.58	-24.7	20.98		-113.13
132	75		- 5.42	20.3	29.38		-110.03
133	65		-15.42	- 9.7	237.78		149.57
134	65		-15.42	.3	237.78		- 4.63
135	85		4.58	10.3	20.98		47.17
136	75		- 5.42	20.3	29.38		-110.03
137	85		4.58	-24.7	20.98		-113.13
138	75		- 5.42	9.7	29.38		52.57
139	65		-15.42	10.3	237.78		-158.83
140	85		4.58	- 9.7	20.98		- 44.43
141	75		- 5.42	.3	29.38		- 1.63
142	75		- 5.42	- 9.7	29.38		52.57

No.	Y	X	Y	X	Y	X	Y
95	30	30.51	30.5	30.5	30.5	30.5	30.5
96	31	30.51	30.5	30.5	30.5	30.5	30.5
97	32	30.5	30.5	30.5	30.5	30.5	30.5
98	33	30.5	30.5	30.5	30.5	30.5	30.5
99	34	30.5	30.5	30.5	30.5	30.5	30.5
100	35	30.5	30.5	30.5	30.5	30.5	30.5
101	36	30.5	30.5	30.5	30.5	30.5	30.5
102	37	30.5	30.5	30.5	30.5	30.5	30.5
103	38	30.5	30.5	30.5	30.5	30.5	30.5
104	39	30.5	30.5	30.5	30.5	30.5	30.5
105	40	30.5	30.5	30.5	30.5	30.5	30.5
106	41	30.5	30.5	30.5	30.5	30.5	30.5
107	42	30.5	30.5	30.5	30.5	30.5	30.5
108	43	30.5	30.5	30.5	30.5	30.5	30.5
109	44	30.5	30.5	30.5	30.5	30.5	30.5
110	45	30.5	30.5	30.5	30.5	30.5	30.5
111	46	30.5	30.5	30.5	30.5	30.5	30.5
112	47	30.5	30.5	30.5	30.5	30.5	30.5
113	48	30.5	30.5	30.5	30.5	30.5	30.5
114	49	30.5	30.5	30.5	30.5	30.5	30.5
115	50	30.5	30.5	30.5	30.5	30.5	30.5
116	51	30.5	30.5	30.5	30.5	30.5	30.5
117	52	30.5	30.5	30.5	30.5	30.5	30.5
118	53	30.5	30.5	30.5	30.5	30.5	30.5
119	54	30.5	30.5	30.5	30.5	30.5	30.5
120	55	30.5	30.5	30.5	30.5	30.5	30.5
121	56	30.5	30.5	30.5	30.5	30.5	30.5
122	57	30.5	30.5	30.5	30.5	30.5	30.5
123	58	30.5	30.5	30.5	30.5	30.5	30.5
124	59	30.5	30.5	30.5	30.5	30.5	30.5
125	60	30.5	30.5	30.5	30.5	30.5	30.5
126	61	30.5	30.5	30.5	30.5	30.5	30.5
127	62	30.5	30.5	30.5	30.5	30.5	30.5
128	63	30.5	30.5	30.5	30.5	30.5	30.5
129	64	30.5	30.5	30.5	30.5	30.5	30.5
130	65	30.5	30.5	30.5	30.5	30.5	30.5
131	66	30.5	30.5	30.5	30.5	30.5	30.5
132	67	30.5	30.5	30.5	30.5	30.5	30.5
133	68	30.5	30.5	30.5	30.5	30.5	30.5
134	69	30.5	30.5	30.5	30.5	30.5	30.5
135	70	30.5	30.5	30.5	30.5	30.5	30.5
136	71	30.5	30.5	30.5	30.5	30.5	30.5
137	72	30.5	30.5	30.5	30.5	30.5	30.5
138	73	30.5	30.5	30.5	30.5	30.5	30.5
139	74	30.5	30.5	30.5	30.5	30.5	30.5
140	75	30.5	30.5	30.5	30.5	30.5	30.5
141	76	30.5	30.5	30.5	30.5	30.5	30.5
142	77	30.5	30.5	30.5	30.5	30.5	30.5

TABLE VII b (1937)

No.	X	Y	x	y	x ²	y ²	xy
143	75	Same as	- 5.42	20.3	29.38	Same as	-110.03
144	75	III b	- 5.42	20.3	29.38	III b	-110.03
145	65		-15.42	10.3	237.78		-158.83
146	65		-15.42	10.3	237.78		-158.83
147	75		- 5.42	.3	29.38		- 1.63
148	65		-15.42	- 9.7	237.78		149.57
149	65		-15.42	.3	237.78		- 4.63
150	--		---	---	---		---
151	75		- 5.42	.3	29.38		- 1.63
152	75		- 5.42	.3	29.38		- 1.63
153	85		4.58	10.3	20.98		47.17
154	85		4.58	10.3	20.98		47.17
155	95		14.58	.3	212.58		4.37
156	65		-15.42	10.3	237.78		-158.83
157	65		-15.42	.3	237.78		- 4.63
158	85		4.58	.3	20.98		1.37
159	95		14.58	.3	212.58		4.37
160	85		4.58	.3	20.98		1.37
161	95		14.58	10.3	212.58		150.17
162	65		-15.42	.3	237.78		- 4.63
163	85		4.58	.3	20.98		1.37
164	85		4.58	-24.7	20.98		-113.13
165	75		- 5.42	-24.7	29.38		133.87
166	65		-15.42	.3	237.78		- 4.63
167	75		- 5.42	-24.7	29.38		133.87
168	95		14.58	20.3	212.58		295.57
169	85		4.58	.3	20.98		1.37
170	95		14.58	10.3	212.58		150.17
171	65		-15.42	10.3	237.78		-158.83
172	75		- 5.42	20.3	29.38		-110.03
173	65		-15.42	- 9.7	237.78		149.57
174	65		-15.42	.3	237.78		- 4.63
175	85		4.58	10.3	20.98		47.17
176	85		4.58	- 9.7	20.98		- 44.43
177	65		-15.42	10.3	237.78		-158.83
178	65		-15.42	- 9.7	237.78		149.57
179	85		4.58	10.3	20.98		47.17
180	65		-15.42	10.3	237.78		-158.83
181	85		4.58	10.3	20.98		47.17
182	75		- 5.42	10.3	29.38		-55.83
183	75		- 5.42	.3	29.38		- 1.63
184	85		4.58	- 9.7	20.98		- 44.43
185	85		4.58	10.3	20.98		47.17
186	65		-15.42	.3	237.78		- 4.63
187	65		-15.42	10.3	237.78		-158.83
188	95		14.58	10.3	212.58		150.17
189	85		4.58	10.3	20.98		47.17
190	85		4.58	20.3	20.98		98.46

TABLE VII b (1957)

No.	X	Y	X	Y	X	Y	X	Y
143	75	Same as	- 5.42	80.3	29.38	Same as	-110.03	
144	75	111 b	- 5.42	80.3	29.38	111 b	-110.03	
145	85		-15.42	10.3	297.78		-158.83	
146	85		-15.42	10.3	297.78		-158.83	
147	75		- 5.42	.3	29.38		- 1.83	
148	85		-15.42	- 9.7	297.78		149.87	
149	85		-15.42	.3	297.78		- 4.83	
150	--		---	---	---		---	
151	75		- 5.42	.3	29.38		- 1.83	
152	75		- 5.42	.3	29.38		- 1.83	
153	85		-4.88	10.3	20.98		47.17	
154	85		-4.88	10.3	20.98		47.17	
155	85		14.88	.3	212.88		4.87	
156	85		-15.42	10.3	297.78		-158.83	
157	85		-15.42	.3	297.78		- 4.83	
158	85		-4.88	.3	20.98		1.87	
159	85		14.88	.3	212.88		4.87	
160	85		-4.88	.3	20.98		1.87	
161	95		14.88	10.3	212.88		150.17	
162	85		-15.42	.3	297.78		- 4.83	
163	85		-4.88	.3	20.98		1.87	
164	85		-4.88	-24.7	20.98		-112.13	
165	75		- 5.42	-24.7	29.38		158.87	
166	85		-15.42	.3	297.78		- 4.83	
167	75		- 5.42	-24.7	29.38		158.87	
168	95		14.88	20.3	212.88		255.87	
169	85		-4.88	.3	20.98		1.87	
170	95		14.88	10.3	212.88		150.17	
171	85		-15.42	10.3	297.78		-158.83	
172	75		- 5.42	20.3	29.38		-110.03	
173	85		-15.42	- 9.7	297.78		149.87	
174	85		-15.42	.3	297.78		- 4.83	
175	85		-4.88	10.3	20.98		47.17	
176	85		-4.88	- 9.7	20.98		- 44.43	
177	85		-15.42	10.3	297.78		-158.83	
178	85		-15.42	- 9.7	297.78		149.87	
179	85		-4.88	10.3	20.98		47.17	
180	85		-15.42	10.3	297.78		-158.83	
181	85		-4.88	10.3	20.98		47.17	
182	75		- 5.42	10.3	29.38		-55.83	
183	75		- 5.42	.3	29.38		- 1.83	
184	85		-4.88	- 9.7	20.98		- 44.43	
185	85		-4.88	10.3	20.98		47.17	
186	85		-15.42	.3	297.78		- 4.83	
187	85		-15.42	10.3	297.78		-158.83	
188	95		14.88	10.3	212.88		150.17	
189	85		-4.88	10.3	20.98		47.17	
190	85		-4.88	20.3	20.98		98.43	

TABLE VII b (1937)

No.	X	Y	x	y	x ²	y ²	xy
191	95	Same as	14.58	10.3	212.58	Same as	150.17
192	65	III b	-15.42	-24.7	237.78	III b	380.87
193	95		14.58	-24.7	212.58		-360.13
194	85		4.58	10.3	20.98		47.17
195	85		4.58	.3	20.98		1.37
196	65		-15.42	.3	237.78		- 4.63
197	85		4.58	- 9.7	20.98		-44.43
198	65		-15.42	.3	237.78		- 4.63
199	85		4.58	-20.3	20.98		98.46
200	65		-15.42	- 9.7	237.78		149.57
201	65		-15.42	-29.7	237.78		380.87
202	65		-15.42	.3	237.78		- 4.63
203	65		-15.42	.3	237.78		- 4.63
204	85		4.58	20.3	20.98		98.46
205	75		- 5.42	10.3	29.38		- 55.83
206	65		-15.42	- 9.7	237.78		149.57
207	85		44.58	10.3	20.98		47.17
208	65		-15.42	- 9.7	237.78		149.57
209	85		4.58	20.3	20.98		98.46
210	85		4.58	10.3	20.98		47.17
211	75		- 5.42	.3	29.38		- 1.63
212	85		4.58	10.3	20.98		47.17
213	95		14.58	10.3	212.58		150.17
214	85		4.58	10.3	20.98		47.17
215	95		14.58	- 9.7	212.58		-141.43
216	65		-15.42	10.3	237.78		-158.83
217	65		-15.42	- 9.7	237.78		149.57
218	95		14.58	20.3	212.58		295.57
219	65		-15.42	- 9.7	237.78		149.57
220	85		4.58	10.3	20.98		47.17
221	65		-15.42	.3	237.78		- 4.63
222	85		4.58	10.3	20.98		47.17
223	85		4.58	10.3	20.98		47.17
224	65		-15.42	- 9.7	237.78		149.57
225	85		44.58	10.3	20.98		47.17
226	65		-15.42	-24.7	237.78		380.87
227	85		4.58	10.3	20.98		47.17
228	85		4.58	10.3	20.98		47.17
229	75		---	---	---		---
230	75		- 5.42	10.3	29.38		-55.83
231	85		4.58	-24.7	20.98		-113.13
232	85		4.58	-24.7	20.98		-113.13
233	65		-15.42	.3	237.78		- 4.63
234	65		-15.42	10.3	237.78		-158.83
235	75		- 5.42	10.3	29.38		- 55.83
236	95		14.58	10.3	212.58		150.17
237	75		-15.42	- 9.7	29.38		52.57
238	65		-15.42	10.3	237.78		-158.83

TABLE VII d (1937)

No.	Z	Y	X	V	S _x	S _y	xy
191	85	as same as	14.58	10.3	212.58	as same as	150.17
192	85	as ill p	-15.42	-24.7	237.78	ill p	290.87
193	85		14.58	-24.7	212.58		-280.13
194	85		4.58	10.3	20.98		47.17
195	85		4.58	3.	20.98		1.57
196	85		-15.42	3.	237.78		-4.83
197	85		4.58	-9.7	20.98		-44.43
198	85		-15.42	3.	237.78		-12.57
199	85		4.58	-20.3	20.98		38.43
200	85		-15.42	-9.7	237.78		149.57
201	85		-15.42	-29.7	237.78		280.87
202	85		-15.42	3.	237.78		-4.83
203	85		-15.42	3.	237.78		-4.83
204	85		4.58	20.3	20.98		38.43
205	75		-3.42	10.3	22.38		-35.83
206	85		-15.42	-9.7	237.78		149.57
207	85		44.58	10.3	20.98		47.17
208	85		-15.42	-9.7	237.78		149.57
209	85		4.58	20.3	20.98		38.43
210	85		4.58	10.3	20.98		47.17
211	75		-3.42	3.	22.38		-1.53
212	85		4.58	10.3	20.98		47.17
213	85		14.58	10.3	212.58		150.17
214	85		4.58	10.3	20.98		47.17
215	85		14.58	-9.7	212.58		-141.43
216	85		-15.42	10.3	237.78		-159.83
217	85		-15.42	-9.7	237.78		149.57
218	85		14.58	20.3	212.58		293.57
219	85		-15.42	-9.7	237.78		149.57
220	85		4.58	10.3	20.98		47.17
221	85		-15.42	3.	237.78		-4.83
222	85		4.58	10.3	20.98		47.17
223	85		4.58	10.3	20.98		47.17
224	85		-15.42	-9.7	237.78		149.57
225	85		44.58	10.3	20.98		47.17
226	85		-15.42	-24.7	237.78		280.87
227	85		4.58	10.3	20.98		47.17
228	85		4.58	10.3	20.98		47.17
229	75		---	---	---		---
230	75		-3.42	10.3	22.38		-35.83
231	85		4.58	-24.7	20.98		-112.13
232	85		6.58	-24.7	20.98		-112.13
233	85		-15.42	3.	237.78		-4.83
234	85		-15.42	10.3	237.78		-159.83
235	75		-3.42	10.3	22.38		-35.83
236	85		14.58	10.3	212.58		150.17
237	75		-15.42	-9.7	22.38		32.57
238	85		-15.42	10.3	237.78		-159.83

TABLE VII b (1937)

No.	X	Y	x	y	x ²	y ²	xy
239	95	Same as	14.58	10.3	212.58	Same as	150.17
240	75	III b	- 5.42	.3	29.38	III b	- 1.63
241	85		4.58	20.3	20.98		98.46
242	85		4.58	- 9.7	20.98		- 44.43
243	85		4.58	20.3	20.98		98.46
244	75		- 5.42	10.3	29.38		- 55.83
245	65		-15.42	.3	237.78		- 4.63
246	75		- 5.42	10.3	29.38		- 55.83
247	75		- 5.42	-24.7	29.38		133.87
248	75		- 5.42	20.3	29.38		-110.03
249	65		-15.42	.3	237.78		- 4.63
250	65		-15.42	- 9.7	237.78		52.57
251	65		-15.42	10.3	237.78		-158.83
252	85		4.58	20.3	20.98		98.46
253	65		-15.42	- 9.7	237.78		149.57
254	95		14.58	20.3	212.58		295.57
255	75		- 5.42	10.3	29.38		- 55.83
256	95		14.58	20.3	212.58		295.57
257	85		4.58	-39.7	20.98		-181.83
258	75		- 5.42	10.3	29.38		- 55.83
259	75		- 5.42	20.3	29.38		-110.03
260	95		14.58	10.3	212.58		150.17
261	--		---	---	---		---
262	85		4.58	.3	20.98		1.37
263	85		4.58	- 9.7	20.98		- 44.43
264	85		4.58	20.3	20.98		98.46
265	65		-15.42	20.3	237.78		-313.03
266	65		-15.42	- 9.7	237.78		149.57
267	85		4.58	.3	20.98		1.37
268	75		- 5.42	- 9.7	29.38		52.57
269	65		-15.42	.3	237.78		- 4.63
270	75		- 5.42	- 9.7	29.38		52.57
271	85		4.58	.3	20.98		1.37
272	65		-15.42	.3	237.78		- 4.63
273	65		-15.42	10.3	237.78		-158.83
274	65		-15.42	.3	237.78		- 4.63
275	85		4.58	- 9.7	20.98		- 44.43
276	65		-15.42	.3	237.78		- 4.63
277	85		4.58	.3	20.98		1.37
278	85		4.58	20.3	20.98		98.46
279	65		-15.42	10.3	237.78		-158.83
280	65		-15.42	.3	237.78		- 4.63
281	85		4.58	.3	20.98		1.37
282	65		-15.42	.3	237.78		- 4.63
283	75		- 5.42	10.3	29.38		-158.83
284	65		-15.42	20.3	237.78		-313.03
285	65		-15.42	.3	237.78		- 4.63
286	85		4.58	.3	20.98		1.37

TABLE VII B (1937)

No.	Z	Y	X	V	X	Z	XZ
232	95	Same as	14.58	10.3	212.58	Same as	120.17
240	75	111 b	- 5.42	3.	23.28	111 b	- 1.52
241	85		4.58	20.3	20.98		98.46
242	85		4.58	- 9.7	20.98		- 44.43
243	85		4.58	20.3	20.98		98.46
244	75		- 5.42	10.3	23.28		- 55.83
245	65		-15.42	3.	237.78		- 4.63
246	75		- 5.42	10.3	23.28		- 55.83
247	75		- 5.42	-24.7	23.28		132.87
248	75		- 5.42	20.3	23.28		-110.03
249	65		-15.42	3.	237.78		- 4.63
250	65		-15.42	- 9.7	237.78		52.57
251	65		-15.42	10.3	237.78		-158.83
252	85		4.58	20.3	20.98		98.46
253	65		-15.42	- 9.7	237.78		149.57
254	95		14.58	20.3	212.58		235.87
255	75		- 5.42	10.3	23.28		- 55.83
256	95		14.58	20.3	212.58		235.87
257	65		4.58	-24.7	20.98		-151.83
258	75		- 5.42	10.3	23.28		- 55.83
259	75		- 5.42	20.3	23.28		-110.03
260	95		14.58	10.3	212.58		120.17
261	--		--	--	--		--
262	85		4.58	3.	20.98		1.57
263	85		4.58	- 9.7	20.98		- 44.43
264	85		4.58	20.3	20.98		98.46
265	65		-15.42	20.3	237.78		-212.03
266	65		-15.42	- 9.7	237.78		149.57
267	85		4.58	3.	20.98		1.57
268	75		- 5.42	- 9.7	23.28		52.57
269	65		-15.42	3.	237.78		- 4.63
270	75		- 5.42	- 9.7	23.28		52.57
271	85		4.58	3.	20.98		1.57
272	65		-15.42	3.	237.78		- 4.63
273	65		-15.42	10.3	237.78		-158.83
274	65		-15.42	3.	237.78		- 4.63
275	85		4.58	- 9.7	20.98		- 44.43
276	65		-15.42	3.	237.78		- 4.63
277	85		4.58	3.	20.98		1.57
278	85		4.58	20.3	20.98		98.46
279	65		-15.42	10.3	237.78		-158.83
280	65		-15.42	3.	237.78		- 4.63
281	85		4.58	3.	20.98		1.57
282	65		-15.42	3.	237.78		- 4.63
283	75		- 5.42	10.3	23.28		-212.03
284	65		-15.42	20.3	237.78		-212.03
285	65		-15.42	3.	237.78		- 4.63
286	85		4.58	3.	20.98		1.57

TABLE VII b (1937)

No.	X	Y	x	y	x ²	y ²	xy
287	85	Same as	4.58	10.3	20.98	Same as	47.17
288	75	III b	- 5.42	.3	29.38	III b	- 1.63
289	95		14.58	.3	212.58		4.37
290	95		14.58	10.3	212.58		150.17
291	65		-15.42	10.3	237.78		-158.83
292	95		14.58	20.3	212.58		295.57
293	85		4.58	20.3	20.98		98.46
294	85		4.58	.3	20.98		1.37
295	95		14.58	.3	212.58		4.37
296	75		- 5.42	20.3	29.38		-110.03
297	85		4.58	- 9.7	20.98		- 44.43
298	65		-15.42	- 9.7	237.78		149.57
299	85		4.58	10.3	20.98		47.17
300	85		4.58	20.3	20.98		98.46
301	65		-15.42	-24.7	237.78		380.87
302	65		-15.42	10.3	237.78		-158.83
303	65		-15.42	10.3	237.78		-158.83
304	85		4.58	.3	20.98		1.37
305	75		- 5.42	.3	29.38		- 1.63
306	85		4.58	.3	20.98		1.37
307	85		4.58	-24.7	20.98		-113.13
308	65		-15.42	.3	237.78		- 4.63
309	75		- 5.42	- 9.7	29.38		52.57
310	85		4.58	10.3	20.98		47.17
311	65		-15.42	- 9.7	237.78		149.57
312	65		-15.42	.3	237.78		- 4.63
313	65		-15.42	- 9.7	237.78		149.57
314	85		4.58	10.3	20.98		47.17
315	65		-15.42	-24.7	237.78		380.87
316	65		-15.42	.3	237.78		- 4.63
317	85		4.58	10.3	20.98		47.17
318	65		-15.42	-39.7	237.78		612.17
319	65		-15.42	-24.7	237.78		380.87
320	65		-15.42	- 9.7	237.78		149.57
321	65		-15.42	- 9.7	237.78		149.57
322	85		4.58	.3	20.98		1.37
323	65		-15.42	.3	237.78		- 4.63
324	75		- 5.42	- 9.7	29.38		52.57
325	65		-15.42	- 9.7	237.78		149.57
326	65		-15.42	-24.7	237.78		380.87
327	65		-15.42	-39.7	237.78		612.17
328	65		-15.42	-39.7	237.78		612.17
329	75		- 5.42	-39.7	29.38		215.17
330	75		- 5.42	-24.7	29.38		133.87
331	--		---	---	---		---
332	75		- 5.42	- 9.7	29.38		52.57
333	65		-15.42	-39.7	237.78		612.17
334	65		-15.42	- 9.7	237.78		149.57

TABLE VII b (1937)

No.	X	Y	X	Y	X	Y	No.
287	88	Same as	4.88	10.3	80.98	Same as	47.17
288	78	111 b	- 5.42	.	89.38	111 b	- 1.88
289	98		14.88	.	818.88		4.87
290	98		14.88	10.3	818.88		180.17
291	88		-18.42	10.3	887.78		-188.88
292	98		14.88	80.3	818.88		888.87
293	88		4.88	80.3	80.98		88.48
294	88		4.88	.	80.98		1.87
295	98		14.88	.	818.88		4.87
296	78		- 5.42	80.3	89.38		-110.08
297	88		4.88	- 9.7	80.98		- 44.42
298	88		-18.42	- 9.7	887.78		148.87
299	88		4.88	10.3	80.98		47.17
300	88		4.88	80.3	80.98		88.48
301	88		-18.42	-24.7	887.78		880.87
302	88		-18.42	10.3	887.78		-188.88
303	88		-18.42	10.3	887.78		-188.88
304	88		4.88	.	80.98		1.87
305	78		- 5.42	.	89.38		- 1.88
306	88		4.88	.	80.98		1.87
307	88		4.88	-24.7	80.98		-110.18
308	88		-18.42	.	887.78		- 4.88
309	78		- 5.42	- 9.7	89.38		88.87
310	88		4.88	10.3	80.98		47.17
311	88		-18.42	- 9.7	887.78		148.87
312	88		-18.42	.	887.78		- 4.88
313	88		-18.42	- 9.7	887.78		148.87
314	88		4.88	10.3	80.98		47.17
315	88		-18.42	-24.7	887.78		880.87
316	88		-18.42	.	887.78		- 4.88
317	88		4.88	10.3	80.98		47.17
318	88		-18.42	-24.7	887.78		818.17
319	88		-18.42	-24.7	887.78		880.87
320	88		-18.42	- 9.7	887.78		148.87
321	88		-18.42	- 9.7	887.78		148.87
322	88		4.88	.	80.98		1.87
323	88		-18.42	.	887.78		- 4.88
324	78		- 5.42	- 9.7	89.38		88.87
325	88		-18.42	- 9.7	887.78		148.87
326	88		-18.42	-24.7	887.78		880.87
327	88		-18.42	-24.7	887.78		818.17
328	88		-18.42	-24.7	887.78		818.17
329	78		- 5.42	-24.7	89.38		818.17
330	78		- 5.42	-24.7	89.38		148.87
331	--		--	--	--		--
332	78		- 5.42	- 9.7	89.38		88.87
333	88		-18.42	-24.7	887.78		818.17
334	88		-18.42	- 9.7	887.78		148.87

TABLE VII b (1937)

No.	X	Y	x	y	x ²	y ²	xy
335	75	Same as	- 5.42	-24.7	29.58	Same as	133.87
336	65	III b	-15.42	-24.7	237.78	III b	380.87
337	65		-15.42	-39.7	237.78		612.17
338	65		-15.42	- 9.7	237.78		149.57
339	65		-15.42	-39.7	237.78		612.17
340	85		4.58	-24.7	20.98		-113.13
341	85		4.58	- 9.7	20.98		- 44.43
342	65		-15.42	-24.7	237.78		380.87
336	27,020	25,095			42,297.86	69,936.33	14,180.34
	80.42	74.69					

$$\text{Correlating: } r = \frac{\sum xy}{\sqrt{\sum x^2} \times \sqrt{\sum y^2}} = \frac{14,180.34}{\sqrt{42,297.86} \times \sqrt{69,936.33}}$$

$$r = \frac{14,180.34}{205.66 \times 264.455} = \frac{14,180.34}{54,387.8}$$

$$r = .267$$

$$\begin{aligned} \text{P.E.}_r &= \frac{.6745 \times (1-r^2)}{\sqrt{N}} = \frac{.6745 \times (1-.267^2)}{\sqrt{336}} \\ &= \frac{.6745 \times .9287}{18.33} = \frac{.6264}{18.33} = .034 \end{aligned}$$

TABLE VII b (1937)

No.	X	Y	x	y	x	y	xy
235	75	Same as	-84.7	-84.7	89.98	Same as	132.87
236	85	111 p	-84.7	-13.42	89.78	111 p	380.87
237	85		-84.7	-13.42	89.78		612.17
238	85		-84.7	-13.42	89.78		149.87
239	85		-84.7	-13.42	89.78		612.17
240	85		-84.7	-4.58	80.98		-112.12
241	85		-84.7	-4.58	80.98		-44.42
242	85		-84.7	-13.42	89.78		380.87
252	85	85	-84.7	-84.7	89.98	85	42,927.88
253	85	85	-84.7	-84.7	89.98	85	42,927.88
254	85	85	-84.7	-84.7	89.98	85	42,927.88
255	85	85	-84.7	-84.7	89.98	85	42,927.88
256	85	85	-84.7	-84.7	89.98	85	42,927.88
257	85	85	-84.7	-84.7	89.98	85	42,927.88
258	85	85	-84.7	-84.7	89.98	85	42,927.88
259	85	85	-84.7	-84.7	89.98	85	42,927.88
260	85	85	-84.7	-84.7	89.98	85	42,927.88
261	85	85	-84.7	-84.7	89.98	85	42,927.88
262	85	85	-84.7	-84.7	89.98	85	42,927.88
263	85	85	-84.7	-84.7	89.98	85	42,927.88
264	85	85	-84.7	-84.7	89.98	85	42,927.88
265	85	85	-84.7	-84.7	89.98	85	42,927.88
266	85	85	-84.7	-84.7	89.98	85	42,927.88
267	85	85	-84.7	-84.7	89.98	85	42,927.88
268	85	85	-84.7	-84.7	89.98	85	42,927.88
269	85	85	-84.7	-84.7	89.98	85	42,927.88
270	85	85	-84.7	-84.7	89.98	85	42,927.88
271	85	85	-84.7	-84.7	89.98	85	42,927.88
272	85	85	-84.7	-84.7	89.98	85	42,927.88
273	85	85	-84.7	-84.7	89.98	85	42,927.88
274	85	85	-84.7	-84.7	89.98	85	42,927.88
275	85	85	-84.7	-84.7	89.98	85	42,927.88
276	85	85	-84.7	-84.7	89.98	85	42,927.88
277	85	85	-84.7	-84.7	89.98	85	42,927.88
278	85	85	-84.7	-84.7	89.98	85	42,927.88
279	85	85	-84.7	-84.7	89.98	85	42,927.88
280	85	85	-84.7	-84.7	89.98	85	42,927.88
281	85	85	-84.7	-84.7	89.98	85	42,927.88
282	85	85	-84.7	-84.7	89.98	85	42,927.88
283	85	85	-84.7	-84.7	89.98	85	42,927.88
284	85	85	-84.7	-84.7	89.98	85	42,927.88
285	85	85	-84.7	-84.7	89.98	85	42,927.88
286	85	85	-84.7	-84.7	89.98	85	42,927.88
287	85	85	-84.7	-84.7	89.98	85	42,927.88
288	85	85	-84.7	-84.7	89.98	85	42,927.88
289	85	85	-84.7	-84.7	89.98	85	42,927.88
290	85	85	-84.7	-84.7	89.98	85	42,927.88
291	85	85	-84.7	-84.7	89.98	85	42,927.88
292	85	85	-84.7	-84.7	89.98	85	42,927.88
293	85	85	-84.7	-84.7	89.98	85	42,927.88
294	85	85	-84.7	-84.7	89.98	85	42,927.88
295	85	85	-84.7	-84.7	89.98	85	42,927.88
296	85	85	-84.7	-84.7	89.98	85	42,927.88
297	85	85	-84.7	-84.7	89.98	85	42,927.88
298	85	85	-84.7	-84.7	89.98	85	42,927.88
299	85	85	-84.7	-84.7	89.98	85	42,927.88
300	85	85	-84.7	-84.7	89.98	85	42,927.88

$$\text{Correlating: } r = \frac{\sum xy}{\sqrt{\sum x^2} \sqrt{\sum y^2}} = \frac{14,180.34}{\sqrt{42,927.88} \times \sqrt{69,927.88}}$$

$$r = \frac{14,180.34}{808.68 \times 84.43} = \frac{14,180.34}{68,387.8}$$

$$r = .207$$

$$F.R.T. = \frac{.6745 \times (1-r)}{.6745 \times (1-.207)} = \frac{.6745 \times .793}{.6745 \times .793} = 1$$

$$= \frac{.6745 \times .793}{18.33} = \frac{.535}{18.33} = .029$$

TABLE VII C (1936)

Correlation of High School Algebra and Algebra Final Grades

No.	X	Y	x	y	x ²	y ²	xy
1	75	Same as	- 2.7	17.7	7.3	Same as	- 47.79
2	95	III c	17.3	17.7	299.3	III c	306.21
3	75		- 2.7	- 2.3	7.3		6.21
4	75		- 2.7	-12.3	7.3		33.21
5	65		-12.7	7.7	161.3		- 97.79
6	85		7.3	7.7	53.3		56.21
7	75		- 2.7	- 2.3	7.3		6.21
8	95		17.3	7.7	299.3		133.21
9	95		17.3	-27.3	299.3		-472.29
10	75		-2.7	7.7	7.3		- 20.79
11	75		- 2.7	7.7	7.3		- 20.79
12	75		- 2.7	7.7	7.3		- 20.79
13	85		7.3	7.7	53.3		56.21
14	85		7.3	- 2.3	53.3		- 16.79
15	65		-12.7	7.7	161.3		- 97.79
16	95		17.3	-12.3	299.3		-212.79
17	75		- 2.7	7.7	7.3		- 20.79
18	85		7.3	7.7	53.3		56.21
19	95		17.3	17.7	299.3		133.21
20	65		-12.7	-12.3	161.3		156.21
21	85		7.3	7.7	53.3		56.21
22	65		-12.7	7.7	161.3		- 97.79
23	75		- 2.7	- 2.3	7.3		6.21
24	85		7.3	17.7	53.3		129.21
25	65		-12.7	7.7	161.3		- 97.79
26	95		17.3	17.7	299.3		306.21
27	85		7.3	7.7	53.3		56.21
28	75		- 2.7	- 2.3	7.3		6.21
29	65		-12.7	7.7	161.3		- 97.79
30	65		-12.7	-27.3	161.3		346.71
31	85		7.3	17.7	53.3		129.21
32	75		- 2.7	-12.3	7.3		33.21
33	65		-12.7	- 2.3	161.3		29.21
34	85		7.3	- 2.3	53.3		- 16.79
35	85		7.3	-12.3	53.3		- 89.79
36	65		-12.7	7.7	161.3		- 97.79
37	85		7.3	- 2.3	53.3		- 16.79
38	85		7.3	-12.3	53.3		- 89.79
39	65		-12.7	-27.3	161.3		346.71
40	65		-12.7	- 2.3	161.3		29.21
41	75		- 2.7	-12.3	7.3		33.21
42	75		- 2.7	7.7	7.3		- 20.79
43	75		- 2.7	7.7	7.3		- 20.79
44	65		-12.7	7.7	161.3		- 97.79
45	95		17.3	- 2.3	299.3		- 39.79
46	95		17.3	7.7	299.3		133.21

Correlation of High School Algebra and Algebra Final Grades

No.	X	Y	X	Y	X	Y
1	75	Same as	17.7	7.5	Same as	-47.79
2	95	111.6	17.7	899.3	111.6	806.21
3	75	-8.7	-8.7	7.3		6.21
4	75	-8.7	-12.3	7.3		33.21
5	65	-12.7	7.7	161.3		-97.79
6	85	7.3	7.7	63.3		63.21
7	75	-8.7	-8.3	7.3		6.21
8	95	17.3	7.7	899.3		133.21
9	95	17.3	-27.3	899.3		-472.29
10	75	-8.7	7.7	7.3		-80.79
11	75	-8.7	7.7	7.3		-80.79
12	75	-8.7	7.7	7.3		-80.79
13	85	7.3	7.7	63.3		63.21
14	85	7.3	-8.3	63.3		-16.79
15	65	-12.7	7.7	161.3		-97.79
16	95	17.3	-12.3	899.3		-212.79
17	75	-8.7	7.7	7.3		-80.79
18	85	7.3	7.7	63.3		63.21
19	95	17.3	17.7	899.3		133.21
20	65	-12.7	-12.3	161.3		156.21
21	85	7.3	7.7	63.3		63.21
22	65	-12.7	7.7	161.3		-97.79
23	75	-8.7	-8.3	7.3		6.21
24	85	7.3	17.7	63.3		123.21
25	65	-12.7	7.7	161.3		-97.79
26	95	17.3	17.7	899.3		806.21
27	85	7.3	7.7	63.3		63.21
28	75	-8.7	-8.3	7.3		6.21
29	65	-12.7	7.7	161.3		-97.79
30	65	-12.7	-27.3	161.3		343.71
31	85	7.3	17.7	63.3		123.21
32	75	-8.7	-12.3	7.3		33.21
33	65	-12.7	-8.3	161.3		29.21
34	85	7.3	-8.3	63.3		-16.79
35	85	7.3	-12.3	63.3		-89.79
36	65	-12.7	7.7	161.3		-97.79
37	85	7.3	-8.3	63.3		-16.79
38	85	7.3	-12.3	63.3		-89.79
39	85	-12.7	-27.3	161.3		343.71
40	65	-12.7	-8.3	161.3		29.21
41	75	-8.7	-12.3	7.3		33.21
42	75	-8.7	7.7	7.3		-80.79
43	75	-8.7	7.7	7.3		-80.79
44	65	-12.7	7.7	161.3		-97.79
45	95	17.3	-8.3	899.3		-29.79
46	95	17.3	7.7	899.3		133.21

TABLE VII c (1936)

No.	X	Y	x	y	x ²	y ²	xy
47	85	Same as	7.3	17.7	53.3	Same as-	129.21
48	65	III c	-12.7	- 2.3	161.3	III c	29.21
49	65		-12.7	- 2.3	161.3		29.21
50	75		- 2.7	7.7	7.3		-20.79
51	85		7.3	- 2.3	53.3		-16.79
52	75		- 2.7	7.7	7.3		- 20.79
53	95		17.3	7.7	299.3		133.21
54	65		-12.7	- 2.3	161.3		29.21
55	65		-12.7	7.7	161.3		- 97.79
56	75		- 2.7	-12.3	7.3		33.21
57	65		-12.7	- 2.3	161.3		29.21
58	65		-12.7	- 2.3	161.3		29.21
59	75		- 2.7	-12.3	7.3		33.21
60	65		-12.7	7.7	161.3		- 97.79
61	75		- 2.7	-12.3	7.3		33.21
62	95		17.3	7.7	299.3		133.21
63	85		7.3	7.7	53.3		56.21
64	85		7.3	7.7	53.3		56.21
65	75		- 2.7	-42.3	7.3		114.21
66	75		- 2.7	7.7	7.3		- 20.79
67	75		- 2.7	7.7	7.3		- 20.79
68	85		7.3	7.7	53.3		56.21
69	75		- 2.7	-12.3	7.3		33.21
70	75		- 2.7	- 2.3	7.3		6.21
71	75		- 2.7	7.7	7.3		- 20.79
72	65		-12.7	7.7	161.3		- 97.79
73	75		- 2.7	7.7	7.3		- 20.79
74	85		7.3	17.7	53.3		129.21
75	85		7.3	7.7	53.3		56.21
76	75		- 2.7	- 2.3	7.3		6.21
77	95		17.3	- 2.3	299.3		- 39.79
78	95		17.3	17.7	299.3		306.21
79	75		- 2.7	- 2.3	7.3		6.21
80	65		-12.7	-12.3	161.3		156.21
81	95		17.3	- 2.3	299.3		- 39.79
82	65		-12.7	- 2.3	161.3		29.21
83	65		-12.7	7.7	161.3		- 97.79
84	75		- 2.7	7.7	7.3		- 20.79
85	75		- 2.7	- 2.3	7.3		6.21
86	75		- 2.7	- 2.3	7.3		6.21
87	95		17.3	7.7	299.3		133.21
88	85		7.3	- 2.3	53.3		- 16.79
89	65		-12.3	-12.3	161.3		156.21
90	95		17.3	7.7	299.3		133.21
91	85		7.3	-12.3	53.3		-89.79
92	65		-12.7	-27.3	161.3		346.71
93	95		17.3	7.7	299.3		133.21
94	85		7.3	7.7	53.3		56.21

TABLE VII c (1936)

No.	X	Y	X	Y	X	Y	X
47	83	same as	7.3	17.7	8.3	same as	180.81
48	85	111 c	-13.7	-8.3	101.3	same as	89.81
49	85		-13.7	-8.3	101.3	111 c	89.81
50	75		-8.7	7.7	7.3		-80.79
51	85		7.3	-8.3	88.3		-16.79
52	75		-8.7	7.7	7.3		-80.79
53	85		17.3	7.7	899.3		133.81
54	85		-13.7	-8.3	101.3		89.81
55	85		-13.7	7.7	101.3		-97.79
56	75		-8.7	-13.3	7.3		33.81
57	85		-13.7	-8.3	101.3		89.81
58	85		-13.7	-8.3	101.3		89.81
59	75		-8.7	-13.3	7.3		33.81
60	85		-13.7	7.7	101.3		-97.79
61	75		-8.7	-13.3	7.3		33.81
62	85		17.3	7.7	899.3		133.81
63	85		7.3	7.7	88.3		89.81
64	85		7.3	7.7	88.3		89.81
65	75		-8.7	-43.3	7.3		114.81
66	75		-8.7	7.7	7.3		-80.79
67	75		-8.7	7.7	7.3		-80.79
68	85		7.3	7.7	88.3		89.81
69	75		-8.7	-13.3	7.3		33.81
70	75		-8.7	-8.3	7.3		8.81
71	75		-8.7	7.7	7.3		-80.79
72	85		-13.7	7.7	101.3		-97.79
73	75		-8.7	7.7	7.3		-80.79
74	85		7.3	17.7	88.3		133.81
75	85		7.3	7.7	88.3		89.81
76	75		-8.7	-8.3	7.3		8.81
77	85		17.3	-8.3	899.3		-97.79
78	85		17.3	17.7	899.3		309.81
79	75		-8.7	-8.3	7.3		8.81
80	85		-13.7	-13.3	101.3		189.81
81	85		17.3	-8.3	899.3		-97.79
82	85		-13.7	-8.3	101.3		89.81
83	85		-13.7	7.7	101.3		-97.79
84	75		-8.7	7.7	7.3		-80.79
85	75		-8.7	-8.3	7.3		8.81
86	75		-8.7	-8.3	7.3		8.81
87	85		17.3	7.7	899.3		133.81
88	85		7.3	-8.3	88.3		-16.79
89	85		-13.7	-13.3	101.3		189.81
90	85		17.3	7.7	899.3		133.81
91	85		7.3	-13.3	88.3		-89.79
92	85		-13.7	-13.3	101.3		89.81
93	85		17.3	7.7	899.3		133.81
94	85		7.3	7.7	88.3		89.81

TABLE VII c(1936)

No.	X	Y	x	y	x ²	y ²	xy
95	95	Same as	17.3	17.7	299.3	Same as	306.21
96	85	III c	7.3	-12.3	53.3	III c	- 89.79
97	65		-12.7	7.7	161.3		- 97.79
98	75		- 2.7	7.7	7.3		- 20.79
99	85		7.3	7.7	53.3		56.21
100	65		-12.7	-12.3	161.3		156.21
101	65		-12.7	-12.3	161.3		156.21
102	65		-12.7	-12.3	161.3		156.21
103	75		- 2.7	7.7	7.3		- 20.79
104	75		- 2.7	-12.3	7.3		33.21
105	65		-12.7	-12.3	161.3		156.21
106	65		-12.7	7.7	161.3		-97.79
107	75		- 2.7	7.7	7.3		- 20.79
108	75		- 2.7	- 2.3	7.3		6.21
109	75		- 2.7	7.7	7.3		- 20.79
110	75		- 2.7	- 2.3	7.3		6.21
111	85		7.3	- 2.3	53.3		- 16.79
112	75		- 2.7	- 2.3	7.3		6.21
113	65		-12.7	7.7	161.3		- 97.79
114	65		-12.7	17.7	161.3		-224.79
115	95		17.3	- 2.3	299.3		- 39.79
116	95		17.3	7.7	299.3		133.21
117	65		-12.7	-12.3	161.3		156.21
118	95		17.3	-12.3	299.3		-212.79
119	85		7.3	-12.3	53.3		- 89.79
120	65		-12.7	- 2.3	161.3		29.21
121	95		17.3	17.7	299.3		306.21
122	85		7.3	- 2.3	53.3		- 16.79
123	65		-12.7	- 2.3	161.3		29.21
124	85		7.3	-12.3	53.3		- 89.79
125	85		7.3	- 2.3	53.3		- 16.79
126	85		7.3	7.7	53.3		56.21
127	85		7.3	- 2.3	53.3		- 16.79
128	75		- 2.7	- 2.3	7.3		6.21
129	75		- 2.7	-12.3	7.3		33.21
130	85		7.3	7.7	53.3		56.21
131	85		7.3	7.7	53.3		56.21
132	--		---	---	---		---
133	85		7.3	- 2.3	53.3		- 16.79
134	--		---	---	---		---
135	65		-12.7	- 2.3	161.3		29.21
136	85		7.3	-12.3	53.3		- 89.79
137	85		7.3	7.7	53.3		56.21
138	65		-12.7	-12.3	161.3		156.21
139	85		7.3	7.7	53.3		56.21
140	75		- 2.7	17.7	7.3		- 47.79
141	85		7.3	17.7	53.3		129.21
142	95		17.3	-12.3	299.3		-212.79

TABLE VII (1933)

No.	X	Y	X	Y	X	Y	X
95	85	85	85	85	85	85	85
96	85	85	85	85	85	85	85
97	85	85	85	85	85	85	85
98	85	85	85	85	85	85	85
99	85	85	85	85	85	85	85
100	85	85	85	85	85	85	85
101	85	85	85	85	85	85	85
102	85	85	85	85	85	85	85
103	85	85	85	85	85	85	85
104	85	85	85	85	85	85	85
105	85	85	85	85	85	85	85
106	85	85	85	85	85	85	85
107	85	85	85	85	85	85	85
108	85	85	85	85	85	85	85
109	85	85	85	85	85	85	85
110	85	85	85	85	85	85	85
111	85	85	85	85	85	85	85
112	85	85	85	85	85	85	85
113	85	85	85	85	85	85	85
114	85	85	85	85	85	85	85
115	85	85	85	85	85	85	85
116	85	85	85	85	85	85	85
117	85	85	85	85	85	85	85
118	85	85	85	85	85	85	85
119	85	85	85	85	85	85	85
120	85	85	85	85	85	85	85
121	85	85	85	85	85	85	85
122	85	85	85	85	85	85	85
123	85	85	85	85	85	85	85
124	85	85	85	85	85	85	85
125	85	85	85	85	85	85	85
126	85	85	85	85	85	85	85
127	85	85	85	85	85	85	85
128	85	85	85	85	85	85	85
129	85	85	85	85	85	85	85
130	85	85	85	85	85	85	85
131	85	85	85	85	85	85	85
132	85	85	85	85	85	85	85
133	85	85	85	85	85	85	85
134	85	85	85	85	85	85	85
135	85	85	85	85	85	85	85
136	85	85	85	85	85	85	85
137	85	85	85	85	85	85	85
138	85	85	85	85	85	85	85
139	85	85	85	85	85	85	85
140	85	85	85	85	85	85	85
141	85	85	85	85	85	85	85
142	85	85	85	85	85	85	85

TABLE VII c (1936)

No.	X	Y	x	y	x ²	y ²	xy
143	65	Same as	-12.7	17.7	161.3	Same as	-224.79
144	65	III c	-12.7	- 2.3	161.3	III c	29.21
145	65		-12.7	17.7	161.3		-224.79
146	65		-12.7	- 2.3	161.3		29.21
147	65		-12.7	- 2.3	161.3		29.21
148	75		- 2.7	- 2.3	7.3		6.21
149	85		7.3	7.7	53.3		56.21
150	65		-12.7	-12.3	161.3		156.21
151	95		17.3	7.7	299.3		133.21
152	85		7.3	17.7	53.3		129.21
153	65		-12.7	7.7	161.3		- 97.79
154	95		17.3	-12.3	299.3		-212.79
155	85		7.3	- 2.3	53.3		- 16.79
156	65		-12.7	-12.3	161.3		156.21
157	85		7.3	7.7	53.3		56.21
158	75		- 2.7	-12.3	7.3		33.21
159	75		- 2.7	- 2.3	7.3		6.21
160	85		7.3	7.7	53.3		56.21
161	65		-12.7	-27.3	161.3		346.71
162	65		-12.7	- 2.3	161.3		29.21
163	65		-12.7	- 2.3	161.3		29.21
164	85		7.3	-12.3	53.3		- 16.79
165	65		-12.7	7.7	161.3		- 97.79
166	85		7.3	7.7	53.3		56.21
167	75		- 2.7	- 2.3	7.3		6.21
168	95		17.3	17.7	299.3		306.21
169	95		17.3	17.7	299.3		306.21
170	85		7.3	- 2.3	53.3		- 16.79
171	85		7.3	-12.3	53.3		- 89.79
172	75		- 2.7	7.7	7.3		- 20.79
173	75		- 2.7	- 2.3	7.3		6.21
174	75		- 2.7	17.7	7.3		- 49.79
175	95		17.3	17.7	299.3		306.21
176	65		-12.7	- 2.3	161.3		29.21
177	85		7.3	- 2.3	53.3		- 16.79
178	95		17.3	17.7	299.3		306.21
179	65		-12.7	-12.3	161.3		156.21
180	85		7.3	7.7	53.3		56.21
181	85		7.3	- 2.3	53.3		- 16.79
182	85		7.3	7.7	53.3		56.21
183	65		-12.7	- 2.3	161.3		29.21
184	75		- 2.7	- 2.3	7.3		6.21
185	85		7.3	7.7	53.3		56.21
186	85		7.3	7.7	53.3		56.21
187	85		7.3	7.7	53.3		56.21
188	65		-12.7	- 2.3	161.3		29.21
189	65		-12.7	- 2.3	161.3		29.21
190	95		17.3	- 2.3	299.3		- 39.79

TABLE VII c (1989)

No.	X	Y	X	Y	X _s	Y _s	X _v
190	85	17.3	-	2.3	299.3	-	- 29.79
189	85	-12.7	-	2.3	191.3	-	29.81
188	85	-12.7	-	2.3	191.3	-	29.81
187	85	7.3	-	2.3	29.3	-	29.81
186	85	7.3	-	2.3	29.3	-	29.81
185	85	7.3	-	2.3	29.3	-	29.81
184	75	- 2.7	-	2.3	7.3	-	29.81
183	85	-12.7	-	2.3	191.3	-	29.81
182	85	7.3	-	2.3	29.3	-	29.81
181	85	7.3	-	2.3	29.3	-	29.81
180	85	-12.7	-	2.3	191.3	-	29.81
179	85	7.3	-	2.3	29.3	-	29.81
178	95	14.3	-	2.3	299.3	-	29.81
177	85	7.3	-	2.3	29.3	-	29.81
176	85	-12.7	-	2.3	191.3	-	29.81
175	85	14.3	-	2.3	299.3	-	29.81
174	75	- 2.7	-	2.3	7.3	-	29.81
173	75	- 2.7	-	2.3	7.3	-	29.81
172	75	- 2.7	-	2.3	7.3	-	29.81
171	85	7.3	-	2.3	29.3	-	29.81
170	85	7.3	-	2.3	29.3	-	29.81
169	95	14.3	-	2.3	299.3	-	29.81
168	95	14.3	-	2.3	299.3	-	29.81
167	75	- 2.7	-	2.3	7.3	-	29.81
166	85	7.3	-	2.3	29.3	-	29.81
165	85	-12.7	-	2.3	191.3	-	29.81
164	85	7.3	-	2.3	29.3	-	29.81
163	85	7.3	-	2.3	29.3	-	29.81
162	85	-12.7	-	2.3	191.3	-	29.81
161	85	-12.7	-	2.3	191.3	-	29.81
160	85	7.3	-	2.3	29.3	-	29.81
159	85	7.3	-	2.3	29.3	-	29.81
158	85	-12.7	-	2.3	191.3	-	29.81
157	85	-12.7	-	2.3	191.3	-	29.81
156	85	-12.7	-	2.3	191.3	-	29.81
155	85	7.3	-	2.3	29.3	-	29.81
154	95	14.3	-	2.3	299.3	-	29.81
153	85	-12.7	-	2.3	191.3	-	29.81
152	85	7.3	-	2.3	29.3	-	29.81
151	95	14.3	-	2.3	299.3	-	29.81
150	85	7.3	-	2.3	29.3	-	29.81
149	85	-12.7	-	2.3	191.3	-	29.81
148	85	-12.7	-	2.3	191.3	-	29.81
147	85	-12.7	-	2.3	191.3	-	29.81
146	85	-12.7	-	2.3	191.3	-	29.81
145	85	-12.7	-	2.3	191.3	-	29.81
144	85	-12.7	-	2.3	191.3	-	29.81
143	85	-12.7	-	2.3	191.3	-	29.81
142	85	7.3	-	2.3	29.3	-	29.81
141	85	7.3	-	2.3	29.3	-	29.81
140	85	-12.7	-	2.3	191.3	-	29.81
139	85	-12.7	-	2.3	191.3	-	29.81
138	85	-12.7	-	2.3	191.3	-	29.81
137	85	-12.7	-	2.3	191.3	-	29.81
136	85	-12.7	-	2.3	191.3	-	29.81
135	85	-12.7	-	2.3	191.3	-	29.81
134	85	-12.7	-	2.3	191.3	-	29.81
133	85	-12.7	-	2.3	191.3	-	29.81
132	85	-12.7	-	2.3	191.3	-	29.81
131	85	-12.7	-	2.3	191.3	-	29.81
130	85	-12.7	-	2.3	191.3	-	29.81
129	85	-12.7	-	2.3	191.3	-	29.81
128	85	-12.7	-	2.3	191.3	-	29.81
127	85	-12.7	-	2.3	191.3	-	29.81
126	85	-12.7	-	2.3	191.3	-	29.81
125	85	-12.7	-	2.3	191.3	-	29.81
124	85	-12.7	-	2.3	191.3	-	29.81
123	85	-12.7	-	2.3	191.3	-	29.81
122	85	-12.7	-	2.3	191.3	-	29.81
121	85	-12.7	-	2.3	191.3	-	29.81
120	85	-12.7	-	2.3	191.3	-	29.81
119	85	-12.7	-	2.3	191.3	-	29.81
118	85	-12.7	-	2.3	191.3	-	29.81
117	85	-12.7	-	2.3	191.3	-	29.81
116	85	-12.7	-	2.3	191.3	-	29.81
115	85	-12.7	-	2.3	191.3	-	29.81
114	85	-12.7	-	2.3	191.3	-	29.81
113	85	-12.7	-	2.3	191.3	-	29.81
112	85	-12.7	-	2.3	191.3	-	29.81
111	85	-12.7	-	2.3	191.3	-	29.81
110	85	-12.7	-	2.3	191.3	-	29.81
109	85	-12.7	-	2.3	191.3	-	29.81
108	85	-12.7	-	2.3	191.3	-	29.81
107	85	-12.7	-	2.3	191.3	-	29.81
106	85	-12.7	-	2.3	191.3	-	29.81
105	85	-12.7	-	2.3	191.3	-	29.81
104	85	-12.7	-	2.3	191.3	-	29.81
103	85	-12.7	-	2.3	191.3	-	29.81
102	85	-12.7	-	2.3	191.3	-	29.81
101	85	-12.7	-	2.3	191.3	-	29.81
100	85	-12.7	-	2.3	191.3	-	29.81

TABLE VII c (1936)

No.	X	Y	x	y	x ²	y ²	xy
191	95	Same as	17.3	7.7	299.3	Same as	133.21
192	95	III c	17.3	7.7	299.3	III c	133.21
193	85		7.3	7.7	53.3		56.21
194	85		7.3	- 2.3	53.3		- 16.79
195	65		-12.7	-12.3	161.3		156.21
196	75		- 2.7	-12.3	7.3		33.21
197	85		7.3	17.7	53.3		129.21
198	85		7.3	17.7	53.3		129.21
199	65		-12.7	7.7	161.3		- 97.79
200	65		-12.7	-27.3	161.3		346.71
201	65		-12.7	- 2.3	161.3		29.21
202	65		-12.7	- 2.3	161.3		29.21
203	75		- 2.7	7.7	7.3		- 20.79
204	75		- 2.7	7.7	7.3		- 20.79
205	75		- 2.7	7.7	7.3		- 20.79
206	65		-12.7	7.7	161.3		- 97.79
207	75		- 2.7	7.7	7.3		- 20.79
208	65		-12.7	17.7	161.3		-224.79
209	95		17.3	- 2.3	299.3		- 39.79
210	85		7.3	17.7	53.3		129.21
211	65		-12.7	- 2.3	161.3		29.21
212	65		-12.7	- 2.3	161.3		29.21
213	85		7.3	17.7	53.3		129.21
214	85		7.3	- 2.3	53.3		- 16.79
215	75		- 2.7	- 2.3	7.3		6.21
216	75		- 2.7	7.7	7.3		- 20.79
217	75		- 2.7	- 2.3	7.3		6.21
218	95		17.3	7.7	299.3		133.21
219	85		7.3	-12.3	53.3		- 89.79
220	95		17.3	7.7	299.3		133.21
221	65		-12.7	- 2.3	161.3		29.21
222	75		- 2.7	-12.3	7.3		33.21
223	85		7.3	17.7	53.3		129.21
224	85		7.3	- 2.3	53.3		- 16.79
225	85		7.3	-12.3	53.3		- 89.79
226	85		7.3	7.7	53.3		56.21
227	65		-12.7	-12.3	161.3		156.21
228	85		7.3	7.7	53.3		56.21
229	65		-12.7	- 2.3	161.3		29.21
230	65		-12.7	- 2.3	161.3		29.21
231	65		-12.7	7.7	161.3		- 97.79
232	85		7.3	7.7	53.3		56.21
233	95		17.3	7.7	299.3		133.21
234	85		7.3	7.7	53.3		56.21
235	85		7.3	- 2.3	53.3		- 16.79
236	75		- 2.7	7.7	7.3		- 20.79
237	65		-12.7	7.7	161.3		- 97.79
238	95		17.3	7.7	299.3		133.21

TABLE VII c (1950)

NO.	X	Y	X	Y	X	Y	X	Y
191	85	Same as	17.5	7.7	899.5	Same as	13.81	13.81
192	85	111 c	17.5	7.7	899.5	111 c	13.81	13.81
193	85		7.5	7.7	88.5		89.81	89.81
194	85		7.5	- 8.5	88.5		- 19.79	- 19.79
195	85		-18.7	-18.5	181.5		13.81	13.81
196	85		- 8.7	-18.5	7.5		13.81	13.81
197	85		7.5	17.7	88.5		13.81	13.81
198	85		7.5	17.7	88.5		13.81	13.81
199	85		-18.7	7.7	181.5		- 97.79	- 97.79
200	85		-18.7	-87.5	181.5		348.71	348.71
201	85		-18.7	- 8.5	181.5		89.81	89.81
202	85		-18.7	- 8.5	181.5		89.81	89.81
203	75		- 8.7	7.7	7.5		- 80.79	- 80.79
204	75		- 8.7	7.7	7.5		- 80.79	- 80.79
205	75		- 8.7	7.7	7.5		- 80.79	- 80.79
206	85		-18.7	7.7	181.5		- 97.79	- 97.79
207	75		- 8.7	7.7	7.5		- 80.79	- 80.79
208	85		-18.7	17.7	181.5		-334.79	-334.79
209	85		17.5	- 8.5	899.5		- 89.79	- 89.79
210	85		7.5	17.7	88.5		138.81	138.81
211	85		-18.7	- 8.5	181.5		89.81	89.81
212	85		-18.7	- 8.5	181.5		89.81	89.81
213	85		7.5	17.7	88.5		138.81	138.81
214	85		7.5	- 8.5	88.5		- 18.79	- 18.79
215	75		- 8.7	- 8.5	7.5		8.81	8.81
216	75		- 8.7	7.7	7.5		- 80.79	- 80.79
217	75		- 8.7	- 8.5	7.5		8.81	8.81
218	85		17.5	7.7	899.5		138.81	138.81
219	85		7.5	-18.5	88.5		- 89.79	- 89.79
220	85		17.5	7.7	899.5		138.81	138.81
221	85		-18.7	- 8.5	181.5		38.81	38.81
222	75		- 8.7	-18.5	7.5		38.81	38.81
223	85		7.5	17.7	88.5		138.81	138.81
224	85		7.5	- 8.5	88.5		- 18.79	- 18.79
225	85		7.5	-18.5	88.5		- 89.79	- 89.79
226	85		7.5	7.7	88.5		88.81	88.81
227	85		-18.7	-18.5	181.5		188.81	188.81
228	85		7.5	7.7	88.5		88.81	88.81
229	85		-18.7	- 8.5	181.5		88.81	88.81
230	85		-18.7	- 8.5	181.5		88.81	88.81
231	85		-18.7	7.7	181.5		- 97.79	- 97.79
232	85		7.5	7.7	88.5		13.81	13.81
233	85		17.5	7.7	899.5		138.81	138.81
234	85		7.5	7.7	88.5		88.81	88.81
235	85		7.5	- 8.5	88.5		- 18.79	- 18.79
236	75		- 8.7	7.7	7.5		- 80.79	- 80.79
237	85		-18.7	7.7	181.5		- 97.79	- 97.79
238	85		17.5	7.7	899.5		138.81	138.81

TABLE VII c (1936)

No.	X	Y	x	y	x ²	y ²	xy
239	65	Same as	-12.7	7.7	161.3	Same as	- 97.79
240	85	III c	7.3	- 2.3	53.3	III c	- 16.79
241	75		- 2.7	7.7	7.3		- 20.79
242	75		- 2.7	-12.3	7.3		33.21
243	95		17.3	17.7	299.3		306.21
244	95		17.3	17.7	299.3		306.21
245	95		17.3	17.7	299.3		306.21
246	85		7.3	- 2.3	53.3		- 16.79
247	65		-12.7	7.7	161.3		- 97.79
248	65		-12.7	7.7	161.3		- 97.79
249	85		7.3	7.7	53.3		56.21
250	85		7.3	- 2.3	53.3		- 16.79
251	85		7.3	7.7	53.3		56.21
252	65		-12.7	- 2.3	161.3		29.21
253	85		7.3	17.7	53.3		129.21
254	65		-12.7	7.7	161.3		- 97.79
255	85		7.3	7.7	53.3		56.21
256	75		- 2.7	- 2.3	7.3		6.21
257	85		7.3	7.7	53.3		56.21
258	65		-12.7	-42.3	161.3		537.21
259	75		- 2.3	- 2.3	7.3		6.21
260	85		7.3	- 2.3	53.3		- 16.79
261	85		7.3	- 2.3	53.3		- 16.79
262	65		-12.7	-27.3	161.3		346.71
263	75		- 2.7	-27.3	7.3		73.71
264	65		-12.7	-42.3	161.3		537.21
265	65		-12.7	-27.3	161.3		346.71
266	85		7.3	-12.3	53.3		- 89.79
267	85		7.3	-27.3	53.3		-199.29
268	85		7.3	2.3	53.3		- 16.79
269	65		-12.7	-12.3	161.3		156.21
270	75		- 2.7	-27.3	7.3		73.71
271	65		-12.7	-12.3	161.3		156.21
272	65		-12.7	-12.3	161.3		156.21
273	65		-12.7	-42.3	161.3		537.21
274	65		-12.7	-27.3	161.3		346.21
275	85		7.3	7.7	53.3		56.21
276	65		-12.7	- 2.3	161.3		29.21
277	75		- 2.7	-12.3	7.3		33.21
278	85		7.3	- 2.3	53.3		- 16.79
279	65		-12.7	-42.3	161.3		537.21
280	65		-12.7	-12.3	161.3		156.21
281	75		- 2.7	-12.3	7.3		33.21

289 21,685 21,565

30,732.7 41,555.91 11,729.67

77.7 77.3

77.7 77.3

239 21,082 21,663 20,732.7 41,663.21 11,739.57

No.	X	Y	X	Y	X	Y	X	Y
239	75	- 2.7	-12.3	7.3	12.3	7.3	12.3	7.3
240	85	- 2.7	-12.3	7.3	12.3	7.3	12.3	7.3
241	75	- 2.7	-12.3	7.3	12.3	7.3	12.3	7.3
242	75	- 2.7	-12.3	7.3	12.3	7.3	12.3	7.3
243	95	- 2.7	-12.3	7.3	12.3	7.3	12.3	7.3
244	95	- 2.7	-12.3	7.3	12.3	7.3	12.3	7.3
245	95	- 2.7	-12.3	7.3	12.3	7.3	12.3	7.3
246	85	- 2.7	-12.3	7.3	12.3	7.3	12.3	7.3
247	65	-12.7	7.3	12.3	7.3	12.3	7.3	12.3
248	65	-12.7	7.3	12.3	7.3	12.3	7.3	12.3
249	65	- 2.7	-12.3	7.3	12.3	7.3	12.3	7.3
250	65	- 2.7	-12.3	7.3	12.3	7.3	12.3	7.3
251	65	- 2.7	-12.3	7.3	12.3	7.3	12.3	7.3
252	65	-12.7	7.3	12.3	7.3	12.3	7.3	12.3
253	65	- 2.7	-12.3	7.3	12.3	7.3	12.3	7.3
254	65	-12.7	7.3	12.3	7.3	12.3	7.3	12.3
255	85	- 2.7	-12.3	7.3	12.3	7.3	12.3	7.3
256	75	- 2.7	-12.3	7.3	12.3	7.3	12.3	7.3
257	85	- 2.7	-12.3	7.3	12.3	7.3	12.3	7.3
258	65	-12.7	7.3	12.3	7.3	12.3	7.3	12.3
259	75	- 2.7	-12.3	7.3	12.3	7.3	12.3	7.3
260	65	- 2.7	-12.3	7.3	12.3	7.3	12.3	7.3
261	65	- 2.7	-12.3	7.3	12.3	7.3	12.3	7.3
262	65	-12.7	7.3	12.3	7.3	12.3	7.3	12.3
263	75	- 2.7	-12.3	7.3	12.3	7.3	12.3	7.3
264	65	-12.7	7.3	12.3	7.3	12.3	7.3	12.3
265	65	-12.7	7.3	12.3	7.3	12.3	7.3	12.3
266	85	- 2.7	-12.3	7.3	12.3	7.3	12.3	7.3
267	85	- 2.7	-12.3	7.3	12.3	7.3	12.3	7.3
268	85	- 2.7	-12.3	7.3	12.3	7.3	12.3	7.3
269	65	-12.7	7.3	12.3	7.3	12.3	7.3	12.3
270	75	- 2.7	-12.3	7.3	12.3	7.3	12.3	7.3
271	65	-12.7	7.3	12.3	7.3	12.3	7.3	12.3
272	65	-12.7	7.3	12.3	7.3	12.3	7.3	12.3
273	65	-12.7	7.3	12.3	7.3	12.3	7.3	12.3
274	65	-12.7	7.3	12.3	7.3	12.3	7.3	12.3
275	85	- 2.7	-12.3	7.3	12.3	7.3	12.3	7.3
276	65	-12.7	7.3	12.3	7.3	12.3	7.3	12.3
277	75	- 2.7	-12.3	7.3	12.3	7.3	12.3	7.3
278	65	- 2.7	-12.3	7.3	12.3	7.3	12.3	7.3
279	65	-12.7	7.3	12.3	7.3	12.3	7.3	12.3
280	65	-12.7	7.3	12.3	7.3	12.3	7.3	12.3
281	75	- 2.7	-12.3	7.3	12.3	7.3	12.3	7.3

TABUL VIL c (1930)

TABLE VII c (1936)

Correlating:

$$r = \frac{\sum xy}{\sqrt{\sum x^2} \times \sqrt{\sum y^2}} = \frac{11,729.67}{\sqrt{41,555.91} \times \sqrt{30,732.7}}$$

$$= \frac{11,729.67}{35,736.89} = .3282$$

$$P.E._r = \frac{.6745 \times (1-r^2)}{\sqrt{N}} = \frac{.6745 \times (1-.10758)}{\sqrt{279}}$$

$$= \frac{.6745 \times .8924}{16.73} = .0359$$

Correlation:

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \times \sum y^2}} = \frac{11,789.67}{\sqrt{11,789.67 \times 11,789.67}} = .8882$$

$$P.E. = \frac{.6745 \times (1 - r^2)}{\sqrt{n}} = \frac{.6745 \times (1 - .8882^2)}{\sqrt{179}}$$

$$= \frac{.6745 \times .2134}{13.73} = .0329$$

TABLE VII d (1935)

Correlation of High School Algebra and Algebra Final Grade

No.	X	Y	x	y	x ²	y ²	xy
1	65	same as	-13.25	-13	175.56	Same as	172.25
2	95	Table	16.75	7	280.56	Table	117.25
3	75	III d	- 3.25	- 3	10.56	III d	9.75
4	65		-13.25	- 3	175.56		39.75
5	95		16.75	7	280.56		117.25
6	65		-13.25	-13	175.56		172.25
7	85		6.75	-13	45.56		- 87.75
8	75		- 3.25	7	10.56		- 22.75
9	75		- 3.25	17	10.56		- 55.25
10	85		6.75	7	45.56		47.25
11	75		- 3.25	-13	10.56		42.25
12	95		16.75	7	280.56		117.25
13	85		6.75	7	45.56		47.25
14	65		-13.25	7	175.56		- 92.75
15	95		16.75	- 3	280.56		- 50.25
16	75		- 3.25	- 3	10.56		9.75
17	75		- 3.25	7	10.56		- 22.75
18	75		- 3.25	17	10.56		- 55.25
19	75		- 3.25	7	10.56		- 22.75
20	75		- 3.25	- 3	10.56		9.75
21	95		16.75	17	280.56		284.75
22	65		-13.25	- 3	175.56		39.75
23	95		16.75	7	280.56		117.25
24	85		6.75	-28	45.56		-189
25	65		-13.25	- 3	175.56		39.75
26	95		16.75	17	280.56		284.75
27	85		6.75	17	45.56		114.75
28	85		6.75	- 3	45.56		- 20.25
29	95		16.75	7	280.56		117.25
30	85		6.75	- 3	45.56		- 20.25
31	95		16.75	7	280.56		117.25
32	85		6.75	- 3	45.56		- 20.25
33	85		6.75	7	45.56		47.25
34	65		-13.25	7	175.56		- 92.75
35	65		-13.25	7	175.56		- 92.75
36	75		- 3.25	17	10.56		- 55.25
37	65		-13.25	-13	175.56		172.25
38	85		6.75	7	45.56		47.25
39	75		- 3.25	17	10.56		- 55.25
40	95		16.75	- 3	280.56		- 50.25
41	65		-13.25	-13	175.56		172.25
42	65		-13.25	-13	175.56		172.25
43	65		-13.25	-13	175.56		172.25
44	95		16.75	-13	280.56		-217.25
45	65		-13.25	17	175.56		-225.25
46	95		16.75	-28	280.56		-469

TABLE VII 4 (1935)

Correlation of High School Algebra and Algebra Final Grade

No.	X	Y	X	Y	X	Y	X	Y
1	65	65	65	65	65	65	65	65
2	65	65	65	65	65	65	65	65
3	65	65	65	65	65	65	65	65
4	65	65	65	65	65	65	65	65
5	65	65	65	65	65	65	65	65
6	65	65	65	65	65	65	65	65
7	65	65	65	65	65	65	65	65
8	65	65	65	65	65	65	65	65
9	65	65	65	65	65	65	65	65
10	65	65	65	65	65	65	65	65
11	65	65	65	65	65	65	65	65
12	65	65	65	65	65	65	65	65
13	65	65	65	65	65	65	65	65
14	65	65	65	65	65	65	65	65
15	65	65	65	65	65	65	65	65
16	65	65	65	65	65	65	65	65
17	65	65	65	65	65	65	65	65
18	65	65	65	65	65	65	65	65
19	65	65	65	65	65	65	65	65
20	65	65	65	65	65	65	65	65
21	65	65	65	65	65	65	65	65
22	65	65	65	65	65	65	65	65
23	65	65	65	65	65	65	65	65
24	65	65	65	65	65	65	65	65
25	65	65	65	65	65	65	65	65
26	65	65	65	65	65	65	65	65
27	65	65	65	65	65	65	65	65
28	65	65	65	65	65	65	65	65
29	65	65	65	65	65	65	65	65
30	65	65	65	65	65	65	65	65
31	65	65	65	65	65	65	65	65
32	65	65	65	65	65	65	65	65
33	65	65	65	65	65	65	65	65
34	65	65	65	65	65	65	65	65
35	65	65	65	65	65	65	65	65
36	65	65	65	65	65	65	65	65
37	65	65	65	65	65	65	65	65
38	65	65	65	65	65	65	65	65
39	65	65	65	65	65	65	65	65
40	65	65	65	65	65	65	65	65
41	65	65	65	65	65	65	65	65
42	65	65	65	65	65	65	65	65
43	65	65	65	65	65	65	65	65
44	65	65	65	65	65	65	65	65
45	65	65	65	65	65	65	65	65
46	65	65	65	65	65	65	65	65

TABLE VII d (1935)

No.	X	Y	x	y	x ²	y ²	xy
47	85	Same as	6.75	7	45.56	Same as	47.25
48	85	III d	6.75	17	45.56	III d	114.75
49	95		16.75	- 3	280.56		- 50.25
50	65		-13.25	7	175.56		- 92.75
51	65		-13.25	7	175.56		- 92.75
52	85		6.75	-13	45.56		- 87.75
53	85		6.75	17	45.56		114.75
54	65		-13.25	-13	175.56		172.25
55	85		6.75	7	45.56		47.25
56	85		6.75	17	45.56		114.75
57	85		6.75	7	45.56		47.25
58	75		- 3.25	- 3	10.56		9.75
59	65		-13.25	-13	175.56		172.25
60	85		6.75	- 3	45.56		- 20.25
61	65		-13.25	-28	175.56		371.
62	85		6.75	7	45.56		47.25
63	75		- 3.25	-13	10.56		42.25
64	75		- 3.25	7	10.56		- 22.75
65	85		6.75	-28	45.56		-189.
66	65		-13.25	7	175.56		- 92.75
67	85		6.75	- 3	45.56		- 20.25
68	75		- 3.25	7	10.56		- 22.75
69	65		-13.25	-13	175.56		172.25
70	65		-13.25	- 3	175.56		59.75
71	85		6.75	- 3	45.56		- 20.25
72	85		6.75	- 3	45.56		- 20.25
73	95		16.75	7	280.56		117.25
74	95		16.75	7	280.56		117.25
75	95		16.75	- 3	280.56		- 50.25
76	85		6.75	- 3	45.56		- 20.25
77	65		-13.25	7	175.56		- 92.75
78	65		-13.25	- 3	175.56		39.75
79	85		6.75	- 3	45.56		- 20.25
80	85		6.75	- 3	45.56		- 20.25
81	65		-13.25	-28	175.56		371.
82	85		6.75	7	45.56		47.25
83	85		6.75	17	45.56		114.75
84	75		- 3.25	7	10.56		- 22.75
85	75		- 3.25	7	10.56		- 22.75
86	75		- 3.25	17	10.56		- 55.25
87	85		6.75	-28	45.56		-189.
88	75		- 3.25	17	10.56		- 55.25
89	--		---	--	---		----
90	65		-13.25	-13	175.56		172.25
91	75		- 3.25	-13	10.56		42.25
92	85		6.75	- 3	45.56		- 20.25
93	65		-13.25	-13	175.56		172.25
94	85		6.75	7	45.56		47.25

TABLE VII a (1939)

No.	X	Y	X	Y	X	Y	X	Y
47	88	Same as	8.75	7	45.50	Same as	47.25	
48	88	111 d	8.75	17	43.50	111 d	114.75	
49	88		18.75	- 3	380.50		- 50.25	
50	88		-17.25	7	175.50		- 52.75	
51	88		-18.25	7	175.50		- 52.75	
52	88		8.75	-13	45.50		- 57.75	
53	88		8.75	17	45.50		114.75	
54	88		-13.25	-13	175.50		172.25	
55	88		8.75	7	45.50		47.25	
56	88		8.75	17	45.50		114.75	
57	88		8.75	7	45.50		47.25	
58	75		- 3.25	- 3	10.50		8.75	
59	88		-13.25	-13	175.50		172.25	
60	88		8.75	- 3	45.50		- 50.25	
61	88		-13.25	-38	175.50		371.	
62	88		8.75	7	45.50		47.25	
63	75		- 3.25	-13	10.50		42.25	
64	75		- 3.25	7	10.50		- 52.75	
65	88		8.75	-38	45.50		-189.	
66	88		-13.25	7	175.50		- 52.75	
67	88		8.75	- 3	45.50		- 50.25	
68	75		- 3.25	7	10.50		- 52.75	
69	88		-13.25	-13	175.50		172.25	
70	88		-13.25	- 3	175.50		39.75	
71	88		8.75	- 3	45.50		- 50.25	
72	88		8.75	- 3	45.50		- 50.25	
73	88		18.75	7	380.50		117.25	
74	88		18.75	7	380.50		117.25	
75	88		18.75	- 3	380.50		- 50.25	
76	88		8.75	- 3	45.50		- 50.25	
77	88		-13.25	7	175.50		- 52.75	
78	88		-13.25	- 3	175.50		39.75	
79	88		8.75	- 3	45.50		- 50.25	
80	88		8.75	- 3	45.50		- 50.25	
81	88		-13.25	-38	175.50		371.	
82	88		8.75	7	45.50		47.25	
83	88		8.75	17	45.50		114.75	
84	75		- 3.25	7	10.50		- 52.75	
85	75		- 3.25	7	10.50		- 52.75	
86	75		- 3.25	17	10.50		- 55.25	
87	88		8.75	-38	45.50		-189.	
88	75		- 3.25	17	10.50		- 55.25	
89	--		---	--	---		---	
90	88		-13.25	-13	175.50		172.25	
91	75		- 3.25	-13	10.50		42.25	
92	88		8.75	- 3	45.50		- 50.25	
93	88		-13.25	-13	175.50		172.25	
94	88		8.75	7	45.50		47.25	

TABLE VII d (1935)

No.	X	Y	x	y	x^2	y^2	xy
95	95	Same as	16.75	- 3	280.56	Same as	-50.25
96	65	III d	-13.25	- 3	175.56	III d	39.75
97	75		- 3.25	-13	10.56		42.25
98	85		6.75	- 3	45.56		- 20.25
99	95		16.75	7	280.56		117.25
100	75		- 3.25	-13	10.56		42.25
101	85		6.75	- 3	45.56		- 20.25
102	75		- 3.25	-28	10.56		91.
103	85		6.75	7	45.56		47.25
104	75		- 3.25	7	10.56		- 22.75
105	65		-13.25	-13	175.56		172.25
106	65		-13.25	7	175.56		- 92.75
107	75		- 3.25	7	10.56		- 22.75
108	85		6.75	- 3	45.56		- 20.75
109	65		-13.25	7	175.56		- 92.75
110	65		-13.25	- 3	175.56		39.75
111	85		6.75	- 3	45.56		- 20.25
112	85		6.75	-13	45.56		- 87.75
113	75		- 3.25	-13	10.56		42.25
114	75		- 3.25	7	10.56		- 22.75
115	75		- 3.25	17	10.56		- 55.25
116	85		6.75	- 3	45.56		- 20.25
117	75		- 3.25	- 3	10.56		9.75
118	75		- 3.25	7	10.56		- 22.75
119	65		-13.25	- 3	175.56		39.75
120	85		6.75	7	45.56		47.25
121	85		6.75	17	45.56		114.75
122	75		- 3.25	7	10.56		- 22.75
123	75		- 3.25	-13	10.56		42.25
124	85		6.75	7	45.56		47.25
125	85		6.75	7	45.56		47.25
126	75		- 3.25	- 3	10.56		9.75
127	85		6.75	- 3	45.56		- 20.25
128	75		- 3.25	7	10.56		- 22.75
129	75		- 3.25	17	10.56		- 55.25
130	65		-13.25	- 3	175.56		39.75
131	95		16.75	7	280.56		117.25
132	85		6.75	- 3	45.56		- 20.25
133	65		-13.25	- 3	175.56		39.75
134	65		-13.25	- 3	175.56		39.75
135	65		-13.25	17	175.56		-225.25
136	85		6.75	7	45.56		47.25
137	75		- 3.25	-13	10.56		42.25
138	75		- 3.25	-13	10.56		42.25
139	75		- 3.25	7	10.56		- 22.75
140	65		-13.25	7	175.56		- 92.75
141	85		6.75	17	45.56		114.75
142	95		16.75	-13	280.56		-217.75

TABLE VII 6 (1935)

No.	1	Y	X	Z	X	Y
95	95	Same as	16.75	-	280.55	-50.75
96	96	111 5	-13.25	-	175.55	-54.75
97	97	-	-3.25	-15	10.55	43.25
98	98	-	6.75	-	45.55	-50.25
99	99	-	16.75	7	280.55	117.25
100	97	-	-3.25	-15	10.55	43.25
101	98	-	6.75	-	45.55	-50.25
102	97	-	-3.25	-28	10.55	41.
103	98	-	6.75	7	45.55	47.25
104	97	-	-3.25	7	10.55	-52.75
105	95	-13.25	-13.25	-15	175.55	175.25
106	95	-13.25	-13.25	7	175.55	-52.75
107	97	-	-3.25	7	10.55	-52.75
108	95	-	6.75	-	45.55	-50.75
109	95	-13.25	-13.25	7	175.55	-52.75
110	95	-13.25	-13.25	-	175.55	-52.75
111	98	-	6.75	-	45.55	-50.25
112	95	-	6.75	-15	45.55	-57.75
113	97	-	-3.25	-15	10.55	43.25
114	97	-	-3.25	7	10.55	-52.75
115	97	-	-3.25	17	10.55	-55.25
116	95	-	6.75	-	45.55	-50.25
117	97	-	-3.25	-	10.55	47.75
118	97	-	-3.25	7	10.55	-52.75
119	95	-13.25	-13.25	-	175.55	-52.75
120	95	-	6.75	7	45.55	47.25
121	95	-	6.75	17	45.55	114.75
122	97	-	-3.25	7	10.55	-52.75
123	97	-	-3.25	-15	10.55	43.25
124	95	-	6.75	7	45.55	47.25
125	95	-	6.75	7	45.55	47.25
126	97	-	-3.25	-	10.55	47.75
127	95	-	6.75	-	45.55	-50.25
128	97	-	-3.25	7	10.55	-52.75
129	97	-	-3.25	17	10.55	-55.25
130	95	-13.25	-13.25	-	175.55	-52.75
131	95	-	16.75	7	280.55	117.25
132	95	-	6.75	-	45.55	-50.25
133	95	-13.25	-13.25	-	175.55	-52.75
134	95	-13.25	-13.25	-	175.55	-52.75
135	95	-13.25	-13.25	17	175.55	-52.25
136	95	-	6.75	7	45.55	47.25
137	97	-	-3.25	-15	10.55	43.25
138	97	-	-3.25	-15	10.55	43.25
139	97	-	-3.25	7	10.55	-52.75
140	95	-13.25	-13.25	7	175.55	-52.75
141	95	-	6.75	17	45.55	114.75
142	95	-	16.75	-15	280.55	-517.75

TABLE VII d (1935)

No.	X	Y	x	y	x ²	y ²	xy
143	65	Same as	-13.25	7	175.56	Same as	- 92.75
144	75	III d	- 3.25	- 3	10.56	III d	9.75
145	85		6.75	17	45.56		114.75
146	75		- 3.25	-43	10.56		139.75
147	85		6.75	7	45.56		47.25
148	95		16.75	- 3	280.56		- 50.25
149	65		-13.25	- 3	175.56		172.25
150	65		-13.25	-28	175.56		371.
151	65		-13.25	-43	175.56		569.75
152	95		16.75	- 3	280.56		- 50.25
153	65		-13.25	- 3	175.56		39.75
154	75		- 3.25	- 3	10.56		9.75
155	75		- 3.25	-13	10.56		42.25
156	85		6.75	- 3	45.56		- 20.25
157	85		6.75	7	45.56		47.25
158	85		6.75	7	45.56		47.25
159	95		16.75	17	280.56		284.75
160	85		6.75	7	45.56		47.25
161	75		- 3.25	-13	10.56		42.25
162	65		-13.25	-13	175.56		172.25
163	85		6.75	7	45.56		47.25
164	75		- 3.25	- 3	10.56		9.75
165	85		6.75	7	45.56		47.25
166	85		6.75	7	45.56		47.25
167	75		- 3.25	7	10.56		- 22.75
168	85		6.75	- 3	45.56		- 20.25
169	85		6.75	7	45.56		47.25
170	85		6.75	17	45.56		114.75
171	65		-13.25	-13	175.56		172.25
172	65		-13.25	17	175.56		-225.25
173	75		- 3.25	7	10.56		- 22.75
174	75		- 3.25	7	10.56		- 22.75
175	85		6.75	- 3	45.56		- 20.25
176	65		-13.25	- 3	175.56		39.75
177	75		- 3.25	-13	10.56		42.25
178	85		6.75	7	45.56		47.25
179	85		6.75	7	45.56		47.25
180	85		6.75	17	45.56		114.75
181	65		-13.25	-28	175.56		371.
182	65		-13.25	7	175.56		- 92.75
183	65		-13.25	-13	175.56		172.25
184	65		-13.25	- 3	175.56		39.75
185	65		-13.25	-13	175.56		172.25
186	75		- 3.25	17	10.56		- 55.25
187	95		16.75	17	280.56		284.75
188	75		- 3.25	7	10.56		- 22.75
189	85		6.75	7	45.56		47.25
190	85		6.75	- 3	45.56		-20.25

TABLE VII B (1955)

No.	X	Y	X	Y	X	Y	X	Y
143	65	same as	15.25	7	175.55	same as	47.75	- 52.75
144	75	111 6	- 3.25	- 3	16.55	111 6	47.75	47.75
145	65		6.75	17	45.55		114.75	114.75
146	75		- 3.25	- 43	10.55		139.75	139.75
147	65		6.75	7	45.55		47.75	47.75
148	95		16.75	- 3	280.55		- 50.25	- 50.25
149	65		- 13.25	- 3	175.55		175.55	175.55
150	65		- 13.25	- 38	175.55		371	371
151	65		- 13.25	- 43	175.55		389.75	389.75
152	95		16.75	- 3	280.55		- 50.25	- 50.25
153	65		- 13.25	- 3	175.55		39.75	39.75
154	75		- 3.25	- 3	10.55		9.75	9.75
155	75		- 3.25	- 13	10.55		42.25	42.25
156	65		6.75	- 3	45.55		- 30.25	- 30.25
157	65		6.75	7	45.55		47.75	47.75
158	65		6.75	7	45.55		47.75	47.75
159	95		16.75	17	280.55		384.75	384.75
160	65		6.75	7	45.55		47.75	47.75
161	75		- 3.25	- 13	10.55		42.25	42.25
162	65		- 13.25	- 13	175.55		175.25	175.25
163	65		6.75	7	45.55		47.75	47.75
164	75		- 3.25	- 3	10.55		9.75	9.75
165	65		6.75	7	45.55		47.75	47.75
166	65		6.75	7	45.55		47.75	47.75
167	75		- 3.25	- 3	10.55		- 32.75	- 32.75
168	65		6.75	- 3	45.55		- 30.25	- 30.25
169	65		6.75	7	45.55		47.75	47.75
170	65		6.75	17	45.55		114.75	114.75
171	65		- 13.25	- 13	175.55		175.25	175.25
172	65		- 13.25	17	175.55		- 325.25	- 325.25
173	75		- 3.25	7	10.55		- 32.75	- 32.75
174	75		- 3.25	7	10.55		- 32.75	- 32.75
175	65		6.75	- 3	45.55		- 30.25	- 30.25
176	65		- 13.25	- 3	175.55		39.75	39.75
177	75		- 3.25	- 13	10.55		42.25	42.25
178	65		6.75	7	45.55		47.75	47.75
179	65		6.75	7	45.55		47.75	47.75
180	65		6.75	17	45.55		114.75	114.75
181	65		- 13.25	- 38	175.55		371	371
182	65		- 13.25	7	175.55		- 32.75	- 32.75
183	65		- 13.25	- 13	175.55		175.25	175.25
184	65		- 13.25	- 3	175.55		39.75	39.75
185	65		- 13.25	- 13	175.55		175.25	175.25
186	75		- 3.25	17	10.55		- 32.25	- 32.25
187	95		16.75	17	280.55		384.75	384.75
188	75		- 3.25	7	10.55		- 32.75	- 32.75
189	65		6.75	7	45.55		47.75	47.75
190	65		6.75	- 3	45.55		- 30.25	- 30.25

TABLE VII d (1935)

No.	X	Y	x	y	x ²	y ²	xy
191	75	Same as	- 3.25	- 3	10.56	Same as	9.75
192	85	III d	6.75	7	45.56	III d	47.25
193	75		- 3.25	7	10.56		- 22.75
194	85		6.75	17	45.56		114.75
195	75		- 3.25	- 3	10.56		9.75
194	15,180	15,135			19,253.64	27,961	5,270.

78.25 78

$$r = \frac{\sum xy}{\sqrt{\sum x^2} \times \sqrt{\sum y^2}} = \frac{5,270}{\sqrt{19253.64} \times \sqrt{27961}}$$

$$r = \frac{5270}{138.03 \times 167.21} = \frac{5270}{23080} = .228$$

$$P.E._r = \frac{.6745 \times (1-r^2)}{\sqrt{N}} = \frac{.6745 \times (1-.05198)}{\sqrt{194}}$$

$$= \frac{.7394}{13.92} = .053$$

TABLE VII A (1935)

No.	X	Y	X	Y	X	Y	X	Y
191	75	32.85	75	32.85	75	32.85	75	32.85
192	85	111.4	85	111.4	85	111.4	85	111.4
193	75	32.85	75	32.85	75	32.85	75	32.85
194	85	111.4	85	111.4	85	111.4	85	111.4
195	75	32.85	75	32.85	75	32.85	75	32.85
196	15,180	15,180	15,180	15,180	15,180	15,180	15,180	15,180

75 32.85

$$r = \frac{\sum xy}{\sqrt{\sum x^2} \sqrt{\sum y^2}} = \frac{5,270}{\sqrt{138,03} \times \sqrt{107.21}} = .820$$

$$r = \frac{\sum xy}{\sqrt{\sum x^2} \sqrt{\sum y^2}} = \frac{5,270}{\sqrt{138,03} \times \sqrt{107.21}} = .820$$

$$r = \frac{\sum xy}{\sqrt{\sum x^2} \sqrt{\sum y^2}} = \frac{5,270}{\sqrt{138,03} \times \sqrt{107.21}} = .820$$

$$r = \frac{\sum xy}{\sqrt{\sum x^2} \sqrt{\sum y^2}} = \frac{5,270}{\sqrt{138,03} \times \sqrt{107.21}} = .820$$

TABLE VII e (1934)

Correlation of High School Algebra and Algebra Final Grade

No.	X	Y	x	y	x ²	y ²	xy
1	95	95	17.7	16.2	313.29	262.44	286.74
2	85	85	7.7	6.2	59.29	38.44	47.74
3	85	95	7.7	16.2	59.29	262.44	124.74
4	65	75	-12.3	- 3.8	151.29	14.44	46.74
5	95	95	17.7	16.2	313.29	262.44	286.74
6	75	75	- 2.3	- 3.8	5.29	14.44	8.74
7	75	75	- 2.3	- 3.8	5.29	14.44	8.74
8	65	65	-12.3	-13.8	151.29	190.44	169.74
9	65	75	-12.3	- 3.8	151.29	14.44	46.74
10	65	95	-12.3	16.2	151.29	262.44	-199.26
11	65	75	-12.3	- 3.8	151.29	14.44	46.74
12	75	85	- 2.3	6.2	5.29	38.44	- 14.26
13	95	85	17.7	6.2	313.29	38.44	111.74
14	85	95	7.7	16.2	59.29	262.44	124.74
15	75	85	- 2.3	6.2	5.29	38.44	- 14.26
16	85	85	7.7	6.2	59.29	38.44	47.74
17	85	75	7.7	- 3.8	59.29	14.44	- 29.26
18	65	75	-12.3	- 3.8	151.29	14.44	46.74
19	95	85	17.7	6.2	313.29	38.44	111.74
20	75	75	- 2.3	- 3.8	5.29	14.44	8.74
21	65	85	-12.3	6.2	151.29	38.44	- 76.26
22	85	75	7.7	- 3.8	59.29	14.44	- 29.26
23	85	75	7.7	- 3.8	59.29	14.44	- 29.26
24	95	65	17.7	-13.8	313.29	190.44	-244.26
25	65	75	-12.3	- 3.8	151.29	14.44	46.74
26	75	75	- 2.3	- 3.8	5.29	14.44	8.74
27	65	50	-12.3	-28.8	151.29	829.44	354.24
28	65	95	-12.3	16.2	151.29	262.44	-199.26
29	75	85	- 2.3	6.2	5.29	38.44	- 14.26
30	65	75	-12.3	- 3.8	151.29	14.44	46.74
31	95	85	17.7	6.2	313.29	38.44	111.74
32	85	50	7.7	-28.8	59.29	829.44	-221.76
33	95	85	17.7	6.2	313.29	38.44	111.74
34	75	75	- 2.3	- 3.8	5.29	14.44	8.74
35	75	75	- 2.3	- 3.8	5.29	14.44	8.74
36	75	85	- 2.3	6.2	5.29	38.44	- 14.26
37	95	85	17.7	6.2	313.29	38.44	111.74
38	75	95	- 2.3	16.2	5.29	262.44	- 37.26
39	75	65	- 2.3	-13.8	5.29	190.44	31.74
40	95	65	17.7	-13.8	313.29	190.44	-244.26
41	85	75	7.7	- 3.8	59.29	14.44	- 29.26
42	75	75	- 2.3	- 3.8	5.29	14.44	8.74
43	75	65	- 2.3	-13.8	5.29	190.44	31.74
44	75	75	- 2.3	- 3.8	5.29	14.44	8.74
45	65	65	-12.3	-13.8	151.29	190.44	169.74
46	75	85	- 2.3	6.2	5.29	38.44	- 14.26

TABLE VII (1934)

Correlation of High School Algebra and Algebra Final Grade

No.	X	Y	X	Y	X	Y	X	Y
1	95	95	15.5	17.7	95	95	303.44	303.44
2	85	85	8.3	7.7	85	85	303.44	303.44
3	85	85	10.3	7.7	95	95	303.44	303.44
4	85	85	-3.8	-12.3	75	75	14.44	14.44
5	95	95	10.3	17.7	95	95	303.44	303.44
6	75	75	-3.8	-3.3	75	75	14.44	14.44
7	75	75	-3.8	-3.3	75	75	14.44	14.44
8	85	85	-12.3	-12.3	85	85	190.44	190.44
9	85	85	-3.8	-12.3	75	75	14.44	14.44
10	85	85	-12.3	-12.3	95	95	303.44	303.44
11	85	85	-3.8	-12.3	75	75	14.44	14.44
12	75	75	8.3	-3.3	85	85	303.44	303.44
13	95	95	8.3	17.7	85	85	303.44	303.44
14	85	85	10.3	7.7	95	95	303.44	303.44
15	75	75	-3.8	-3.3	85	85	303.44	303.44
16	85	85	8.3	7.7	85	85	303.44	303.44
17	85	85	-3.8	7.7	75	75	14.44	14.44
18	85	85	-3.8	-12.3	75	75	14.44	14.44
19	95	95	8.3	17.7	85	85	303.44	303.44
20	75	75	-3.8	-3.3	75	75	14.44	14.44
21	85	85	-12.3	-12.3	85	85	303.44	303.44
22	85	85	-3.8	7.7	75	75	14.44	14.44
23	85	85	-3.8	7.7	75	75	14.44	14.44
24	95	95	-12.3	17.7	85	85	303.44	303.44
25	85	85	-3.8	-12.3	75	75	14.44	14.44
26	75	75	-3.8	-3.3	75	75	14.44	14.44
27	85	85	-12.3	-12.3	85	85	303.44	303.44
28	85	85	-12.3	-12.3	95	95	303.44	303.44
29	75	75	-3.8	-3.3	85	85	303.44	303.44
30	85	85	-12.3	-12.3	75	75	14.44	14.44
31	95	95	8.3	17.7	85	85	303.44	303.44
32	85	85	-3.8	7.7	85	85	303.44	303.44
33	95	95	8.3	17.7	85	85	303.44	303.44
34	75	75	-3.8	-3.3	75	75	14.44	14.44
35	75	75	-3.8	-3.3	75	75	14.44	14.44
36	75	75	-3.8	-3.3	85	85	303.44	303.44
37	95	95	8.3	17.7	85	85	303.44	303.44
38	75	75	-3.8	-3.3	95	95	303.44	303.44
39	75	75	-12.3	-3.3	85	85	303.44	303.44
40	95	95	-12.3	17.7	85	85	303.44	303.44
41	85	85	-3.8	7.7	75	75	14.44	14.44
42	75	75	-3.8	-3.3	75	75	14.44	14.44
43	75	75	-12.3	-3.3	85	85	303.44	303.44
44	75	75	-3.8	-3.3	75	75	14.44	14.44
45	85	85	-12.3	-12.3	190.44	190.44	303.44	303.44
46	85	85	-3.8	-3.3	85	85	303.44	303.44

TABLE VII e (1934)

No.	X	Y	x	y	x ²	y ²	xy
47	75	75	- 2.3	- 3.8	5.29	14.44	- 8.74
48	75	65	- 2.3	-13.8	5.29	190.44	31.74
49	85	85	-12.3	6.2	151.29	38.44	- 76.26
50	75	50	- 2.3	-28.8	5.29	829.44	66.24
51	95	85	17.7	6.2	313.29	38.44	111.74
52	75	75	- 2.3	- 3.8	5.29	14.44	8.74
53	85	85	7.7	6.2	59.29	38.44	47.74
54	65	75	-12.3	- 3.8	151.29	14.44	46.74
55	75	85	- 2.3	6.2	5.29	38.44	- 14.26
56	75	85	- 2.3	6.2	5.29	38.44	- 14.26
57	95	85	17.7	6.2	313.29	38.44	111.74
58	75	75	- 2.3	- 3.8	5.29	14.44	8.74
59	85	85	7.7	6.2	59.29	38.44	47.74
60	75	75	- 2.3	- 3.8	5.29	14.44	8.74
61	75	50	- 2.3	-28.8	5.29	829.44	66.24
62	75	85	- 2.3	6.2	5.29	38.44	- 14.26
63	65	75	-12.3	- 3.8	151.29	14.44	46.74
64	85	75	7.7	- 3.8	59.29	14.44	- 29.26
65	75	65	- 2.3	-13.8	5.29	190.44	31.74
66	75	50	- 2.3	-28.8	5.29	829.44	66.24
67	65	95	-12.3	16.2	151.29	262.44	-199.26
68	65	85	-12.3	6.2	151.29	38.44	- 76.26
69	95	85	17.7	6.2	313.29	38.44	111.74
70	65	75	-12.3	- 3.8	151.29	14.44	46.74
71	85	75	7.7	- 3.8	59.29	14.44	- 29.26
72	75	85	- 2.3	6.2	5.29	38.44	- 14.26
73	65	65	-12.3	-13.8	151.29	190.44	169.74
74	75	85	- 2.3	6.2	5.29	38.44	- 14.26
75	95	95	17.7	16.2	313.29	262.44	286.74
76	65	85	-12.3	6.2	151.29	38.44	- 76.26
77	75	65	- 2.3	-13.8	5.29	190.44	31.74
78	65	85	-12.3	6.2	151.29	38.44	- 76.26
79	65	85	-12.3	6.2	151.29	38.44	-76.26
80	65	85	-12.3	6.2	151.29	38.44	- 76.26
81	65	75	-12.3	- 3.8	151.29	14.44	46.74
82	95	85	17.7	6.2	313.29	38.44	111.74
83	65	85	-12.3	6.2	151.29	38.44	- 76.26
84	65	75	-12.3	- 3.8	151.29	14.44	46.74
85	65	75	-12.3	- 3.8	151.29	14.44	46.74
86	65	85	-12.3	6.2	151.29	38.44	- 76.26
87	85	85	7.7	6.2	59.29	38.44	47.74
88	85	95	7.7	16.2	59.29	262.44	124.74
89	65	65	-12.3	-13.8	151.29	190.44	169.74
90	--	--	---	---	---	---	---
91	95	85	17.7	6.2	313.29	38.44	111.74
92	85	75	7.7	- 3.8	59.29	14.44	- 29.26
93	95	65	17.7	-13.8	313.29	190.44	-244.26
94	65	65	-12.3	-13.8	151.29	190.44	169.74

TABLE VII e (1934)

No.	z	y	x	v	x	v	x	v
47	75	75	- 8.3	- 8.3	5.23	14.44	- 8.74	-
48	75	75	- 8.3	-13.8	5.23	150.44	47.74	-
49	85	85	-13.3	8.3	151.23	38.44	- 75.25	-
50	75	50	- 8.3	-28.8	5.23	823.44	62.24	-
51	95	85	17.7	8.3	213.23	38.44	111.74	-
52	75	75	- 8.3	- 8.3	5.23	14.44	8.74	-
53	85	85	7.7	8.3	59.23	38.44	47.74	-
54	85	75	-13.3	- 8.3	151.23	14.44	48.74	-
55	75	85	- 8.3	8.3	5.23	38.44	- 14.25	-
56	75	85	- 8.3	- 8.3	5.23	38.44	- 14.25	-
57	95	85	17.7	8.3	213.23	38.44	111.74	-
58	75	75	- 8.3	- 8.3	5.23	14.44	8.74	-
59	85	85	7.7	8.3	59.23	38.44	47.74	-
60	75	75	- 8.3	- 8.3	5.23	14.44	8.74	-
61	75	50	- 8.3	-28.8	5.23	823.44	62.24	-
62	75	85	- 8.3	- 8.3	5.23	38.44	- 14.25	-
63	85	75	-13.3	- 8.3	151.23	14.44	48.74	-
64	85	85	7.7	- 8.3	59.23	14.44	- 22.25	-
65	75	85	- 8.3	-13.8	5.23	120.44	21.74	-
66	75	50	- 8.3	-28.8	5.23	823.44	62.24	-
67	85	85	-13.3	10.3	151.23	38.44	-122.25	-
68	85	85	-13.3	8.3	151.23	38.44	- 75.25	-
69	95	85	17.7	8.3	213.23	38.44	111.74	-
70	85	75	-13.3	- 8.3	151.23	14.44	48.74	-
71	85	75	7.7	- 8.3	59.23	14.44	- 22.25	-
72	75	85	- 8.3	- 8.3	5.23	38.44	- 14.25	-
73	85	85	-13.3	-13.8	151.23	120.44	159.74	-
74	75	85	- 8.3	8.3	5.23	38.44	- 14.25	-
75	95	95	17.7	10.3	213.23	38.44	283.74	-
76	85	85	-13.3	8.3	151.23	38.44	- 75.25	-
77	75	85	- 8.3	-13.8	5.23	120.44	21.74	-
78	85	85	-13.3	8.3	151.23	38.44	- 75.25	-
79	85	85	-13.3	8.3	151.23	38.44	- 75.25	-
80	85	85	-13.3	8.3	151.23	38.44	- 75.25	-
81	85	75	-13.3	- 8.3	151.23	14.44	48.74	-
82	95	85	17.7	8.3	213.23	38.44	111.74	-
83	85	85	-13.3	8.3	151.23	38.44	- 75.25	-
84	85	75	-13.3	- 8.3	151.23	14.44	48.74	-
85	85	85	-13.3	- 8.3	151.23	14.44	48.74	-
86	85	85	-13.3	8.3	151.23	38.44	- 75.25	-
87	85	85	7.7	8.3	59.23	38.44	47.74	-
88	85	95	7.7	10.3	59.23	823.44	122.74	-
89	85	85	-13.3	-13.8	151.23	120.44	159.74	-
90	--	--	--	--	--	--	--	-
91	95	95	17.7	8.3	213.23	38.44	111.74	-
92	85	75	7.7	- 8.3	59.23	14.44	- 22.25	-
93	95	95	17.7	-13.8	213.23	120.44	-224.25	-
94	85	85	-13.3	-13.8	151.23	120.44	159.74	-

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TABLE VII e (1934)

No.	X	Y	x	y	x ²	y ²	xy
95	75	75	- 2.3	- 3.8	5.29	14.44	84.74
96	65	85	-12.3	6.2	151.29	38.44	- 76.26
97	95	75	17.7	- 3.8	313.29	14.44	- 67.26
98	75	75	- 2.3	- 3.8	5.29	14.44	8.74
99	65	75	-12.3	- 3.8	151.29	14.44	46.74
100	75	75	- 2.3	- 3.8	5.29	14.44	8.74
101	75	75	- 2.3	- 3.8	5.29	14.44	8.84
102	75	85	- 2.3	6.2	5.29	38.44	- 14.26
103	65	85	-12.3	6.2	151.29	38.44	- 76.26
104	75	75	- 2.3	- 3.8	5.29	14.44	8.74
105	75	65	- 2.3	-13.8	5.29	190.44	31.74
106	85	85	7.7	6.2	59.29	38.44	47.74
107	95	85	17.7	6.2	313.29	38.44	111.74
108	75	85	- 2.3	6.2	5.29	38.44	- 14.26
109	75	85	- 2.3	6.2	5.29	38.44	- 14.26
110	85	85	7.7	6.2	59.29	38.44	47.74
111	75	65	- 2.3	-13.8	5.29	190.44	31.74
112	95	85	17.7	6.2	313.29	38.44	111.74
113	65	75	-12.3	- 3.8	151.29	14.44	46.74
114	75	95	- 2.3	16.2	5.29	262.44	- 37.26
115	95	95	17.7	16.2	313.29	262.44	286.74
116	65	75	-12.3	- 3.8	151.29	14.44	46.74
117	95	75	17.7	- 3.8	313.29	14.44	- 67.26
118	85	95	7.7	16.2	59.29	262.44	124.74
119	85	95	7.7	16.2	59.29	262.44	124.74
120	75	85	- 2.3	6.2	5.29	38.44	- 14.26
121	65	85	-12.3	6.2	151.29	38.44	- 76.26
122	65	85	-12.3	6.2	151.29	38.44	- 76.26
123	65	95	-12.3	16.2	151.29	262.44	-199.26
124	95	85	17.7	6.2	313.29	38.44	111.74
125	65	50	-12.3	-28.8	151.29	829.44	354.24
126	95	85	17.7	6.2	313.29	38.44	111.74
125	9,665	9,855			14,519.25	14,207.	3,140.53
	77.3	78.8					

$$\text{Correlating: } r = \frac{\sum xy}{\sqrt{\sum x^2} \times \sqrt{\sum y^2}} = \frac{3140.53}{\sqrt{14519.25} \times \sqrt{14207.}}$$

$$r = \frac{3140.53}{120.49 \times 119.19} = \frac{3140.53}{14361.2} = .219$$

$$\text{P.E.}_r = \frac{.6745 \times (1-r^2)}{\sqrt{N}} = \frac{.6745 \times .9520}{\sqrt{125}}$$

$$\text{P.E.}_r = \frac{.6421}{\sqrt{125}} = \frac{.6421}{11.18} = .057$$

TABLE VII e (1934)

No.	X	Y	Z	V	Xs	Ys	Zs	Vs
95	75	75	- 2.3	- 2.3	6.3	14.44	6.3	8.74
96	65	65	-12.3	6.3	151.3	38.44	6.3	- 76.26
97	95	75	17.7	- 3.8	213.3	14.44	6.3	- 57.26
98	75	75	- 2.3	- 3.8	6.3	14.44	6.3	8.74
99	65	75	-12.3	- 3.8	151.3	14.44	6.3	48.74
100	75	75	- 2.3	- 3.8	6.3	14.44	6.3	8.74
101	75	75	- 2.3	- 3.8	6.3	14.44	6.3	8.84
102	75	65	- 2.3	6.3	6.3	38.44	6.3	- 14.26
103	65	65	-12.3	6.3	151.3	38.44	6.3	- 76.26
104	75	75	- 2.3	- 3.8	6.3	14.44	6.3	8.74
105	75	65	- 2.3	-12.3	6.3	130.44	6.3	31.74
106	65	65	7.7	6.3	69.3	38.44	6.3	47.74
107	95	65	17.7	6.3	213.3	38.44	6.3	111.74
108	75	65	- 2.3	6.3	6.3	38.44	6.3	- 14.26
109	75	65	- 2.3	6.3	6.3	38.44	6.3	- 14.26
110	65	65	7.7	6.3	69.3	38.44	6.3	47.74
111	75	65	- 2.3	-12.3	6.3	130.44	6.3	31.74
112	95	65	17.7	6.3	213.3	38.44	6.3	111.74
113	65	75	-12.3	- 3.8	151.3	14.44	6.3	48.74
114	75	75	- 2.3	12.3	6.3	383.44	6.3	- 7.26
115	65	65	17.7	12.3	213.3	383.44	6.3	286.74
116	65	75	-12.3	- 3.8	151.3	14.44	6.3	48.74
117	95	75	17.7	- 3.8	213.3	14.44	6.3	- 57.26
118	65	65	7.7	12.3	69.3	383.44	6.3	124.74
119	65	65	7.7	12.3	69.3	383.44	6.3	124.74
120	75	65	- 2.3	6.3	6.3	38.44	6.3	- 14.26
121	65	65	-12.3	6.3	151.3	38.44	6.3	- 76.26
122	65	65	-12.3	6.3	151.3	38.44	6.3	- 76.26
123	65	65	-12.3	12.3	151.3	383.44	6.3	-199.26
124	95	65	17.7	6.3	213.3	38.44	6.3	111.74
125	65	65	-12.3	-22.3	151.3	383.44	6.3	324.24
126	95	65	17.7	6.3	213.3	38.44	6.3	111.74
127	95	95	17.7	6.3	213.3	14.207	6.3	120.26

127 9,558 9,885

Correlating: $r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}} = \frac{3140.53}{\sqrt{3140.53 \times 3140.53}}$

$$r = \frac{3140.53}{\sqrt{3140.53 \times 3140.53}} = \frac{3140.53}{3140.53} = .913$$

$$P.E. = \frac{.6745 \times (1 - r^2)}{\sqrt{125}} = \frac{.6745 \times .1881}{\sqrt{125}} = .097$$

$$P.E. = \frac{.6745}{\sqrt{125}} = .097$$

Conclusions.

Class	1938	1937	1936	1935	1934
Coefficient of Correlation	.57	.267	.3282	.228	.219
Tests Used	H.S. alg. grades Coll. alg."	H.S. alg. grades Coll. alg."	H.S. alg. grades Coll. alg."	H.S. alg. grades Coll. alg."	H.S. alg. grades Coll. alg."
Cases studied	227	336	379	194	125

A survey of the above values of the correlation coefficient shows immediately that while this relation would be of value in the absence of other measures of ability it is not as effective as the algebra placement test given at the beginning of the college course for predicting success in the acquiring of skill in algebraic manipulations.

The values of r are all positive and are of sufficient magnitude to indicate a real relation between the two sets of data studied. It is not accurate enough, however, to replace the placement test. High school grades probably have somewhat of a negative aspect and do indicate some who will do poorly but fail to indicate many who will do reasonably well when the necessity or desire to do so is present.

In order to get a graphical representation of the frequency of occurrence of algebra placement test scores and high school grades in cases of men who failed college algebra, ogives have been plotted showing these features for the five classes, and are shown on pages 184, 185, 186, 187, and 188.

For ease of comparison both ogives for each year have been plotted on one sheet with the same scales used for both

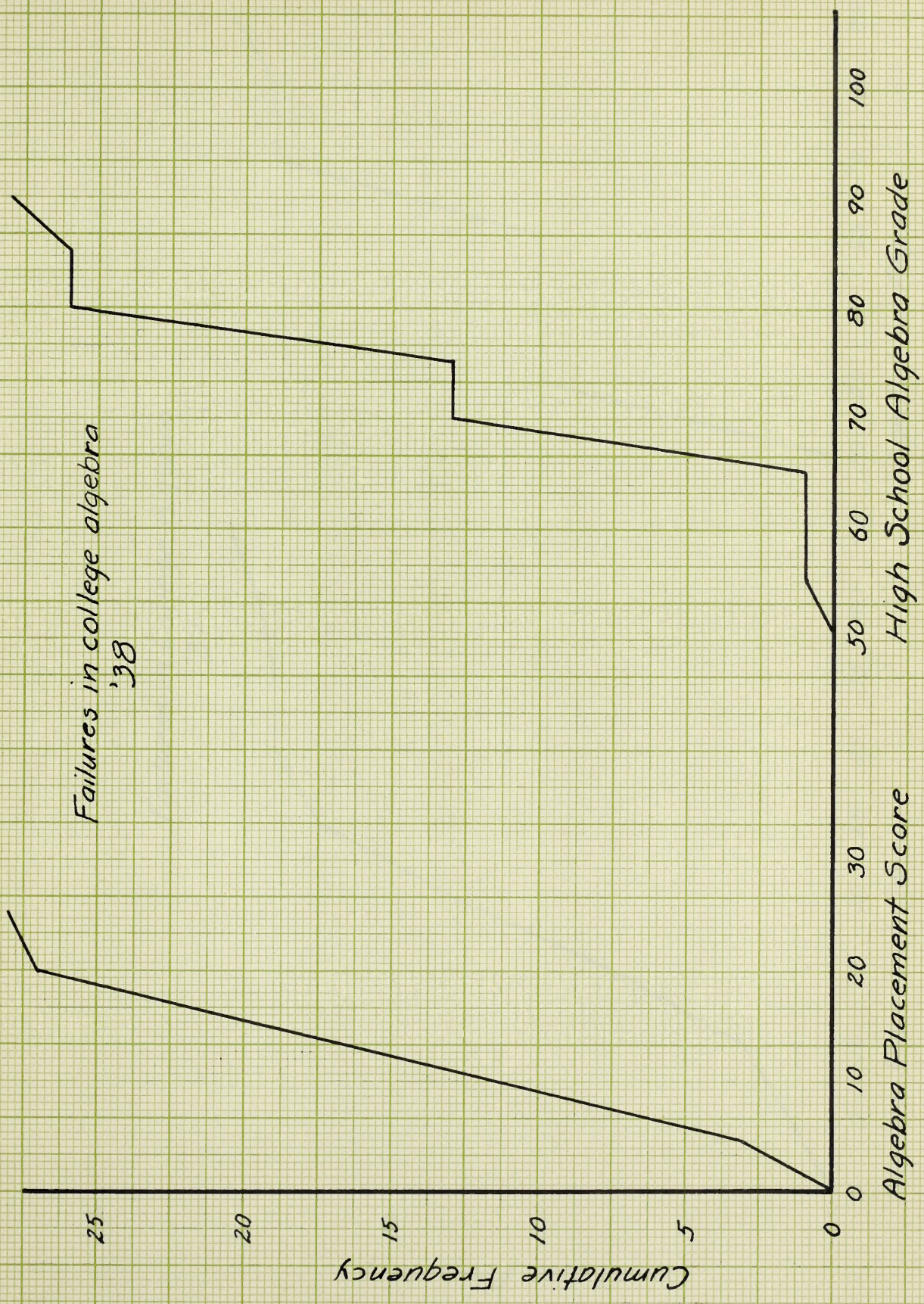
Conclusions.

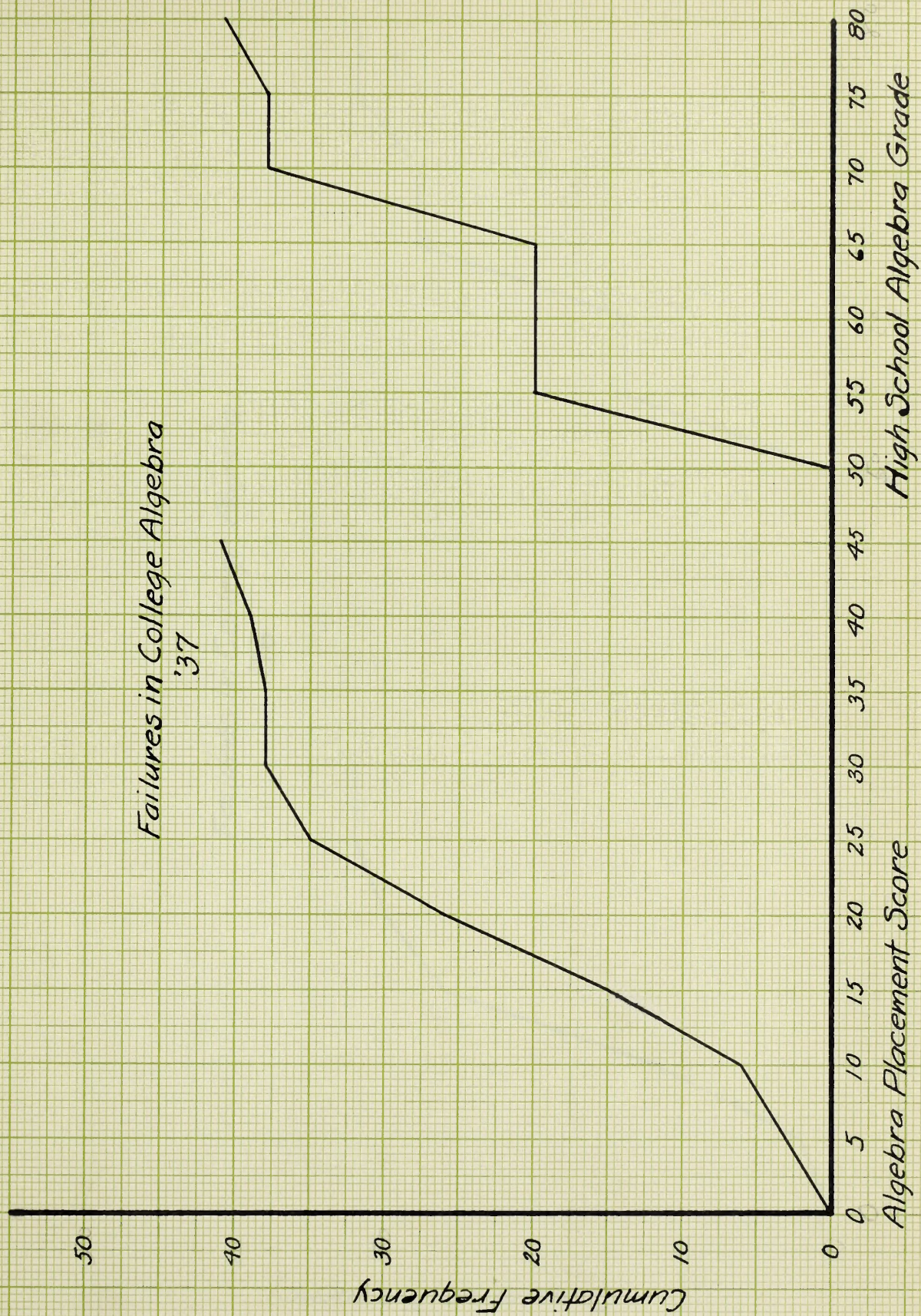
Class	1932	1937	1938	1939	1940
Coefficient of Correlation	.67	.587	.3282	.438	.219
Tests Used	E.S. Algebra Coll. Algebra	E.S. Algebra Coll. Algebra	E.S. Algebra Coll. Algebra	E.S. Algebra Coll. Algebra	E.S. Algebra Coll. Algebra
Cases studied	237	235	275	194	125

A survey of the above values of the correlation coefficient shows immediately that while this relation would be of value in the absence of other measures of ability it is not as effective as the algebra placement test given at the beginning of the college course for predicting success in the acquiring of skill in algebraic manipulations.

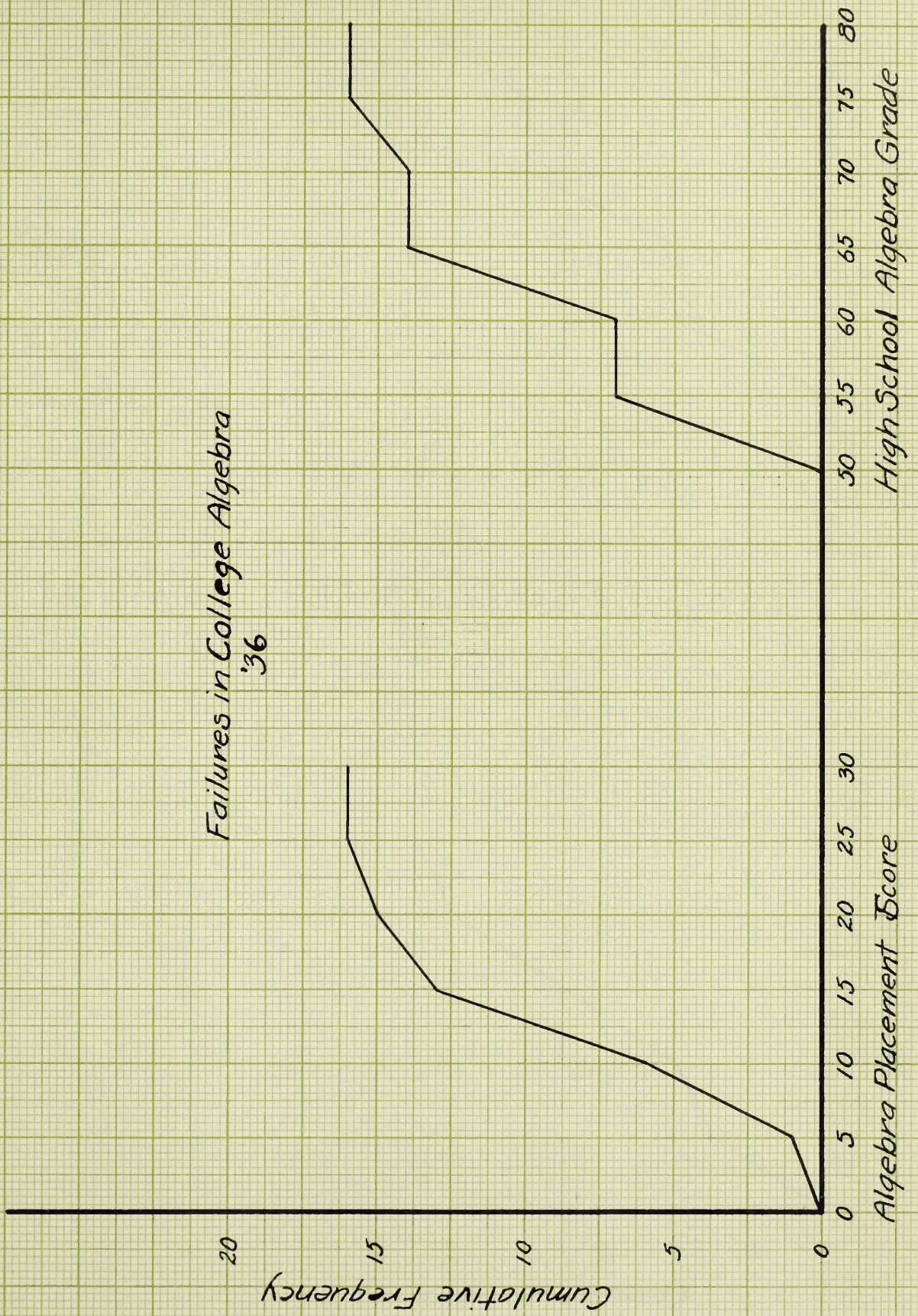
The values of r are all positive and are of sufficient magnitude to indicate a real relation between the two sets of data studied. It is not accurate enough, however, to replace the placement test. High school grades probably have somewhat of a negative aspect and do indicate some who will do poorly but fail to indicate many who will do reasonably well when the necessity or desire to do so is present. In order to get a graphical representation of the frequency of occurrence of algebra placement test scores and high school grades in cases of men who failed college algebra, ogives have been plotted showing these curves for the five classes, and are shown on pages 184, 185, 186, 187, and 188.

For ease of comparison both ogives for each year have been plotted on one sheet with the same scales used for both





Failures in College Algebra '36



Failures in College Algebra '35



Failures in College Algebra '34



curves. The ordinate scale represents cumulative frequency hence a steep, nearly vertical, portion of the curve represents a large number of cases and a slowly rising curve indicates a small number of cases.

A study of the curves shows that in each case the slopes of the ogives cover practically the same range of values, indicating a close agreement between range of placement test score and range of high school grade for the men who failed the college course. This is true in spite of the lack of close agreement between these data for all men in the class.

It is noticed that the placement ogive is smoother than the high school ogive showing a more uniform distribution of placement scores over the range of values.

From the '38 curve it is noticed that the largest increase in frequency of failure came between high school grades of 64 and 80. There were men who failed college algebra who had received grades above 80 but they were few in number.

From the class of '37, 18 men who failed college algebra had high school grades of 65 or 70 while only 3 men had grades above 70 and no one had 80 or above.

In the class of '36 most failures had high school grades of 65 or below while all cases were below 75.

In the class of '35 the ogive of high school grades has a nearly constant slope from 0 up to its end at a grade

curves. The ordinate scale represents cumulative frequency hence a steep, nearly vertical, portion of the curve represents a large number of cases and a slowly rising curve indicates a small number of cases.

A study of the curves shows that in each case the slopes of the curves cover practically the same range of values, indicating a close agreement between range of placement test score and range of high school grade for the men who failed the college course. This is true in spite of the lack of close agreement between these data for all men in the class.

It is noticed that the placement curve is smoother than the high school curve showing a more uniform distribution of placement scores over the range of values. From the '38 curve it is noticed that the largest increase in frequency of failures came between high school grades of 64 and 80. There were men who failed college algebra who had received grades above 80 but they were few in number.

From the class of '37, 16 men who failed college algebra had high school grades of 65 or 70 while only 3 men had grades above 70 and no one had 80 or above. In the class of '36 most failures had high school grades of 65 or below while all cases were below 75. In the class of '35 the curve of high school grades has a nearly constant slope from 0 up to its end at a grade

of 80, and there is no point of lower value where there is any noticeable change in the trend.

The class of '34 fails to produce any cases of college algebra failure where the high school grade was above 60.

There is evidently no high school grade which is very definitely the borderline between those who will pass and those who will fail. It is fair to assume from a survey of the five curves that if a person has obtained a grade of 70 or lower he should be made to demonstrate by examination his ability or be forced to do special preparatory work. Again is emphasized the conclusion tentatively drawn earlier in the paper that some form of placement test is indispensable.

Even if the relation discovered is not close enough to render unnecessary the algebra placement test for selection purposes, it will be worth while to see how much importance should be attached to the high school record of a student seeking admission to a college.

The correlation calculations will follow in the succeeding pages.

of 80, and there is no point of lower value where there is any noticeable change in the trend.

The class of 'E' fails to produce any cases of college algebra failure where the high school grade was above 60. There is evidently no high school grade which is very definitely the borderline between those who will pass and those who will fail. It is fair to assume from a survey of the five curves that if a person has obtained a grade of 70 or lower he should be made to demonstrate by examination his ability or be forced to do special preparatory work. Again is emphasized the conclusion tentatively drawn earlier in the paper that some form of placement test is indispensable.

Chapter VII.RELATION OF HIGH SCHOOL SCHOLASTIC AVERAGE TO
COLLEGE ALGEBRA FINAL GRADES

In order to find every indication of future performance in algebra which may possibly exist, the total high school scholastic average of the five classes under consideration will be correlated with the corresponding algebra final grades in this chapter.

The many variable factors affecting the significance of all grades, and high school grades in particular, have been discussed previously and will not be reviewed here. Suffice it to say that the discovery of a meaningful relation between these two sets of grades is hoped for rather than expected.

Even if the relation discovered is not close enough to render unnecessary the algebra placement test for sectioning purposes, it will be worth while to see how much importance should be attached to the high school record of a student seeking admission to a college.

The correlation calculations will follow in the succeeding pages.

Chapter VII.RELATION OF HIGH SCHOOL SCIENTIFIC AVERAGE TO
COLLEGE AVERAGE FINAL GRADES

In order to find every indication of future performance in algebra which may possibly exist, the total high school scientific average of the five classes under consideration will be correlated with the corresponding algebra final grades in this chapter.

The many variable factors affecting the intelligence of all grades, and high school grades in particular, have been discussed previously and will not be reviewed here. Suffice it to say that the discovery of a meaningful relation between these two sets of grades is hoped for rather than expected.

Even if the relation discovered is not close enough to render unnecessary the algebra placement test for sectioning purposes, it will be worth while to see how much importance should be attached to the high school record of a student seeking admission to a college. The correlation calculations will follow in the succeeding pages.

TABLE VIII a (1938)

Correlation of High School Average and Algebra Final Grade

No.	X	Y	x	y	x^2	y^2	xy
1	--	--	--	--	--	---	---
2	75	75	- 1	0.7	1	.49	- 0.7
3	75	65	- 1	- 9.3	1	86.49	9.3
4	65	50	-11	-24.3	121	590.49	267.3
5	65	85	-11	10.7	121	114.49	-117.7
6	65	75	-11	0.7	121	.49	- 7.7
7	75	65	- 1	- 9.3	1	86.49	9.3
8	75	85	- 1	10.7	1	114.49	- 10.7
9	65	85	-11	10.7	121	114.49	-117.7
10	65	40	-11	-34.3	121	1176.49	377.3
11	85	65	9	- 9.3	81	86.49	- 83.7
12	65	50	-11	-24.3	121	590.49	267.3
13	85	65	9	- 9.3	81	86.49	- 83.7
14	--	--	--	---	--	---	---
15	65	50	-11	-24.3	121	590.49	267.3
16	75	85	- 1	10.7	1	114.49	- 10.7
17	85	85	9	10.7	81	114.49	96.3
18	85	75	9	0.7	81	.49	6.3
19	75	75	- 1	0.7	1	.49	- 0.7
20	75	85	- 1	10.7	1	114.49	- 10.7
21	75	85	- 1	10.7	1	114.49	- 10.7
22	85	95	9	20.7	81	428.49	186.3
23	75	50	- 1	-24.3	1	590.49	24.3
24	95	95	19	20.7	361	428.49	393.3
25	75	75	- 1	0.7	1	.49	- 0.7
26	95	85	19	10.7	361	114.49	203.3
27	75	85	- 1	10.7	1	114.49	- 10.7
28	65	75	-11	0.7	121	.49	- 7.7
29	85	85	9	10.7	81	114.49	96.3
30	65	50	-11	-24.3	121	590.49	267.3
31	75	75	- 1	0.7	1	.49	- 0.7
32	85	65	9	- 9.3	81	86.49	- 83.7
33	75	75	- 1	0.7	1	.49	9.3
34	75	85	- 1	10.7	1	114.49	- 10.7
35	75	65	- 1	- 9.3	1	86.49	9.3
36	75	65	- 1	- 9.3	1	86.49	9.3
37	75	75	- 1	0.7	1	.49	- 0.7
38	85	95	9	20.7	81	428.49	186.3
39	85	95	9	20.7	81	428.49	186.3
40	85	95	9	20.7	81	428.49	186.3
41	85	75	9	0.7	81	.49	6.3
42	75	75	- 1	0.7	1	.49	- 0.7
43	85	85	9	10.7	81	114.49	96.3
44	75	75	- 1	0.7	1	.49	- 0.7
45	75	65	- 1	- 9.3	1	86.49	9.3
46	85	95	9	20.7	81	428.49	186.3

TABLE VIII a (1938)

Correlation of High School Averages and Algebra Final Grade

No.	X	Y	X	Y	X	Y	X
1	75	75	1	75	1	75	1
2	75	75	1	75	1	75	1
3	75	75	1	75	1	75	1
4	75	75	1	75	1	75	1
5	75	75	1	75	1	75	1
6	75	75	1	75	1	75	1
7	75	75	1	75	1	75	1
8	75	75	1	75	1	75	1
9	75	75	1	75	1	75	1
10	75	75	1	75	1	75	1
11	75	75	1	75	1	75	1
12	75	75	1	75	1	75	1
13	75	75	1	75	1	75	1
14	75	75	1	75	1	75	1
15	75	75	1	75	1	75	1
16	75	75	1	75	1	75	1
17	75	75	1	75	1	75	1
18	75	75	1	75	1	75	1
19	75	75	1	75	1	75	1
20	75	75	1	75	1	75	1
21	75	75	1	75	1	75	1
22	75	75	1	75	1	75	1
23	75	75	1	75	1	75	1
24	75	75	1	75	1	75	1
25	75	75	1	75	1	75	1
26	75	75	1	75	1	75	1
27	75	75	1	75	1	75	1
28	75	75	1	75	1	75	1
29	75	75	1	75	1	75	1
30	75	75	1	75	1	75	1
31	75	75	1	75	1	75	1
32	75	75	1	75	1	75	1
33	75	75	1	75	1	75	1
34	75	75	1	75	1	75	1
35	75	75	1	75	1	75	1
36	75	75	1	75	1	75	1
37	75	75	1	75	1	75	1
38	75	75	1	75	1	75	1
39	75	75	1	75	1	75	1
40	75	75	1	75	1	75	1
41	75	75	1	75	1	75	1
42	75	75	1	75	1	75	1
43	75	75	1	75	1	75	1
44	75	75	1	75	1	75	1
45	75	75	1	75	1	75	1
46	75	75	1	75	1	75	1

TABLE VIII a (1938)

No.	X	Y	x	y	x ²	y ²	xy
47	75	95	- 1	20.7	1	428.49	- 20.7
48	75	50	- 1	-24.3	1	590.49	24.3
49	75	65	- 1	- 9.3	1	86.49	9.3
50	--	--	--	--	--	---	---
51	85	75	9	0.7	81	.49	6.3
52	75	65	- 1	- 9.3	1	86.49	9.3
53	75	95	- 1	20.7	1	428.49	- 20.7
54	85	85	9	10.7	81	114.49	96.3
55	--	--	--	--	--	---	---
56	75	75	- 1	0.7	1	.49	- 0.7
57	65	75	-11	0.7	121	.49	- 7.7
58	75	95	- 1	20.7	1	428.49	- 20.7
59	85	95	9	20.7	81	428.49	186.3
60	75	65	-11	- 9.3	121	86.49	102.3
61	75	65	- 1	- 9.3	1	86.49	9.3
62	85	75	9	0.7	81	.49	6.3
63	75	65	- 1	- 9.3	1	86.49	9.3
64	65	65	-11	- 9.3	121	86.49	102.3
65	85	65	9	20.7	81	428.49	186.3
66	65	95	-11	20.7	121	428.49	-227.7
67	75	85	- 1	10.7	1	114.49	- 10.7
68	75	75	- 1	0.7	1	.49	- 0.7
69	85	95	9	20.7	81	428.49	186.3
70	85	75	9	0.7	81	.49	6.3
71	65	75	-11	0.7	121	.49	- 7.7
72	75	50	- 1	-24.3	1	590.49	24.3
73	--	--	--	--	--	---	---
74	85	95	9	20.7	81	428.49	186.3
75	65	75	-11	0.7	121	.49	- 7.7
76	75	75	- 1	0.7	1	.49	- 0.7
77	75	85	- 1	10.7	1	114.49	- 10.7
78	85	95	9	20.7	81	428.49	186.3
79	85	75	9	0.7	81	.49	6.3
80	75	85	- 1	10.7	1	114.49	- 10.7
81	75	65	- 1	- 9.3	1	86.49	9.3
82	65	75	-11	0.7	121	.49	- 7.7
83	75	85	- 1	10.7	1	114.49	- 10.7
84	65	75	-11	0.7	121	.49	- 7.7
85	65	65	-11	- 9.3	121	86.49	102.3
86	75	95	- 1	20.7	1	428.49	- 20.7
87	75	50	- 1	-24.3	1	590.49	24.3
88	75	75	- 1	0.7	1	.49	- 0.7
89	75	85	- 1	10.7	1	114.49	- 10.7
90	85	75	9	0.7	81	.49	6.3
91	75	85	- 1	10.7	1	114.49	- 10.7
92	75	65	- 1	- 9.3	1	86.49	9.3
93	65	50	-11	-24.3	121	590.49	267.3
94	75	85	- 1	10.7	1	114.49	- 10.7

TABLE VIII a (1931)

1931	1930	1929	1928	1927	1926	1925	1924
47	47	47	47	47	47	47	47
48	48	48	48	48	48	48	48
49	49	49	49	49	49	49	49
50	50	50	50	50	50	50	50
51	51	51	51	51	51	51	51
52	52	52	52	52	52	52	52
53	53	53	53	53	53	53	53
54	54	54	54	54	54	54	54
55	55	55	55	55	55	55	55
56	56	56	56	56	56	56	56
57	57	57	57	57	57	57	57
58	58	58	58	58	58	58	58
59	59	59	59	59	59	59	59
60	60	60	60	60	60	60	60
61	61	61	61	61	61	61	61
62	62	62	62	62	62	62	62
63	63	63	63	63	63	63	63
64	64	64	64	64	64	64	64
65	65	65	65	65	65	65	65
66	66	66	66	66	66	66	66
67	67	67	67	67	67	67	67
68	68	68	68	68	68	68	68
69	69	69	69	69	69	69	69
70	70	70	70	70	70	70	70
71	71	71	71	71	71	71	71
72	72	72	72	72	72	72	72
73	73	73	73	73	73	73	73
74	74	74	74	74	74	74	74
75	75	75	75	75	75	75	75
76	76	76	76	76	76	76	76
77	77	77	77	77	77	77	77
78	78	78	78	78	78	78	78
79	79	79	79	79	79	79	79
80	80	80	80	80	80	80	80
81	81	81	81	81	81	81	81
82	82	82	82	82	82	82	82
83	83	83	83	83	83	83	83
84	84	84	84	84	84	84	84
85	85	85	85	85	85	85	85
86	86	86	86	86	86	86	86
87	87	87	87	87	87	87	87
88	88	88	88	88	88	88	88
89	89	89	89	89	89	89	89
90	90	90	90	90	90	90	90
91	91	91	91	91	91	91	91
92	92	92	92	92	92	92	92
93	93	93	93	93	93	93	93
94	94	94	94	94	94	94	94

TABLE VIII a (1938)

No.	X	Y	x	y	x ²	y ²	xy
95	--	--	--	--	--	---	---
96	65	75	-11	0.7	121	.49	- 7.7
97	85	85	9	10.7	81	114.49	96.3
98	75	85	- 1	10.7	1	114.49	- 10.7
99	65	65	-11	- 9.3	121	86.49	102.3
100	--	--	--	--	--	---	---
101	85	95	9	20.7	81	428.49	186.3
102	65	85	-11	10.7	121	114.49	-117.7
103	65	40	-11	-34.3	121	1176.49	377.3
104	--	--	--	--	--	---	---
105	65	65	9	- 9.3	81	86.49	- 83.7
106	65	65	-11	- 9.3	121	86.49	102.3
107	75	75	- 1	0.7	1	.49	- 0.7
108	75	85	- 1	10.3	1	114.49	- 10.3
109	--	--	--	---	--	---	---
110	75	50	- 1	-24.3	1	590.49	24.3
111	75	85	- 1	10.7	1	114.49	- 10.7
112	65	65	-11	- 9.3	121	86.49	102.3
113	85	85	9	10.7	81	114.49	96.3
114	85	95	9	20.7	81	428.49	186.3
115	65	65	-11	- 9.3	121	86.49	102.3
116	65	40	-11	-34.3	121	1176.49	377.3
117	85	75	9	0.7	81	.49	6.3
118	85	65	9	- 9.3	81	86.49	- 83.7
119	85	95	9	20.7	81	428.49	186.3
120	65	75	-11	0.7	121	.49	- 7.7
121	75	65	- 1	- 9.3	1	86.49	9.3
122	75	95	- 1	20.7	1	428.49	- 20.7
123	65	50	-11	-24.3	121	590.49	-267.3
124	85	95	9	20.7	81	428.49	186.3
125	85	85	9	10.7	81	114.49	96.3
126	75	75	- 1	0.7	1	.49	- 0.7
127	75	65	- 1	- 9.3	1	86.49	9.3
128	95	95	19	20.7	361	428.49	393.3
129	75	85	- 1	10.7	1	114.49	- 10.7
130	75	85	- 1	10.7	1	114.49	- 10.7
131	75	95	- 1	20.7	1	428.49	- 20.7
132	75	75	- 1	0.7	1	.49	- 0.7
133	85	95	9	20.7	81	428.49	186.3
134	75	75	- 1	0.7	1	.49	- 0.7
135	--	--	--	--	--	---	---
136	75	65	- 1	- 9.3	1	86.49	9.3
137	75	65	- 1	- 9.3	1	86.49	9.3
138	75	85	- 1	10.7	1	114.49	- 10.7
139	65	40	-11	-34.3	121	1176.49	377.3
140	85	95	9	20.7	81	428.49	186.3
141	75	85	- 1	10.7	1	114.49	- 10.7
142	85	95	9	20.7	81	428.49	186.3

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Wx.	S _g	S _x	V	X	Y	Z	No.
---	---	---	---	---	---	---	95
7.7 -	84.49	131	0.7	-11	75	85	96
8.89	84.49	81	10.7	9	85	85	97
7.01 -	84.49	1	10.7	-1	85	75	98
102.3	84.49	131	-9.3	-11	85	85	99
---	---	---	---	---	---	---	100
3.881	84.49	81	20.7	9	95	85	101
-11.7	84.49	131	10.7	-11	85	85	102
37.3	118.49	131	-34.3	-11	40	85	103
---	---	---	---	---	---	---	104
-8.7	84.49	81	-9.3	9	85	85	105
102.3	84.49	131	-9.3	-11	85	85	106
0.7 -	84.49	1	0.7	-1	75	75	107
-10.3	114.49	1	10.3	-1	85	75	108
---	---	---	---	---	---	---	109
34.3	84.49	1	-34.3	-1	80	75	110
-10.7	114.49	1	10.7	-1	85	75	111
102.3	84.49	131	-9.3	-11	85	85	112
30.3	114.49	81	10.7	9	85	85	113
102.3	84.49	81	20.7	9	95	85	114
102.3	84.49	131	-9.3	-11	85	85	115
37.3	118.49	131	-34.3	-11	40	85	116
0.3	84.49	81	0.7	9	75	85	117
-8.7	84.49	81	-9.3	9	85	85	118
102.3	84.49	81	20.7	9	95	85	119
7.7 -	84.49	131	0.7	-11	75	85	120
9.3	84.49	1	-9.3	-1	85	75	121
-30.7	84.49	1	20.7	-1	75	75	122
-34.3	84.49	131	-34.3	-11	80	85	123
102.3	84.49	81	20.7	9	95	85	124
30.3	114.49	81	10.7	9	85	85	125
0.7 -	84.49	1	0.7	-1	75	75	126
9.3	84.49	1	-9.3	-1	85	75	127
30.3	84.49	131	20.7	19	95	85	128
-10.7	114.49	1	10.7	-1	85	75	129
-10.7	114.49	1	10.7	-1	85	75	130
-30.7	84.49	1	20.7	-1	75	75	131
0.7 -	84.49	1	0.7	-1	75	75	132
102.3	84.49	81	20.7	9	95	85	133
0.7 -	84.49	1	0.7	-1	75	75	134
---	---	---	---	---	---	---	135
9.3	84.49	1	-9.3	-1	85	75	136
9.3	84.49	1	-9.3	-1	85	75	137
-10.7	114.49	1	10.7	-1	85	75	138
37.3	118.49	131	-34.3	-11	40	85	139
102.3	84.49	81	20.7	9	95	85	140
-10.7	114.49	1	10.7	-1	85	75	141
102.3	84.49	81	20.7	9	95	85	142

TABLE VIII a (1938)

No.	X	y	x	y	x ²	y ²	xy
143	65	50	-11	-24.3	121	590.49	267.3
144	75	75	-1	0.7	1	.49	- 0.7
145	85	95	9	20.7	81	428.49	186.3
146	75	65	-1	- 9.3	1	86.49	9.3
147	85	65	9	- 9.3	81	86.49	- 83.7
148	75	95	-1	20.7	1	428.49	- 20.7
149	85	65	9	- 9.3	81	86.49	- 83.7
150	75	75	-1	0.7	1	.49	- 0.7
151	95	85	19	10.7	361	114.49	203.3
152	65	65	-11	- 9.3	121	86.49	102.3
153	85	75	9	0.7	81	.49	6.3
154	75	75	-1	0.7	1	.49	- 0.7
155	85	95	9	20.3	81	428.49	186.3
156	65	40	-11	-34.3	121	1176.49	377.3
157	85	85	9	10.7	81	114.49	96.3
158	75	85	-1	10.7	1	114.49	- 10.7
159	75	85	-1	10.7	1	114.49	- 10.7
160	85	65	9	- 9.3	81	86.49	- 83.7
161	75	65	-1	- 9.3	1	86.49	9.3
162	75	50	-1	-24.3	1	590.49	24.3
163	75	65	-1	- 9.3	1	86.49	9.3
164	75	65	-1	- 9.3	1	86.49	9.3
165	85	85	9	10.7	81	114.49	96.3
166	75	75	-1	0.7	1	.49	- 0.7
167	75	65	-1	- 9.3	1	86.49	9.3
168	65	50	-11	-24.3	121	590.49	267.3
169	65	65	-11	- 9.3	121	86.49	102.3
170	75	50	-1	-24.3	1	590.49	24.3
171	75	85	-1	10.7	1	114.49	- 10.7
172	65	65	-11	- 9.3	121	86.49	102.3
173	75	75	-1	0.7	1	.49	- 0.7
174	75	75	-1	0.7	1	.49	- 0.7
175	75	75	-1	0.7	1	.49	- 0.7
176	75	50	-1	-24.3	1	590.49	24.3
177	75	85	-1	10.7	1	114.49	- 10.7
178	75	85	-1	10.7	1	114.49	- 10.7
179	85	65	9	- 9.3	81	86.49	- 83.7
180	65	75	-11	0.7	121	.49	- 7.7
181	75	75	-1	0.7	1	.49	- 0.7
182	75	85	-1	10.7	1	114.49	- 10.7
183	75	40	-1	-34.3	1	1176.49	34.3
184	75	75	-1	0.7	1	.49	- 0.7
185	85	85	9	10.7	81	.49	96.3
186	75	75	-1	0.7	1	.49	- 0.7
187	85	85	9	10.7	81	114.49	96.3
188	--	--	--	---	--	---	---
189	95	95	19	20.7	361	428.49	393.3
190	75	65	-1	- 9.3	1	86.49	9.3

TABLE VII a (1958)

No.	Z	Y	X	V	X ₂	S ₂	X ₂
149	68	60	-11	-24.8	131	890.49	897.5
148	75	75	-1	0.7	1	.49	-0.7
147	68	68	9	80.7	81	428.49	188.3
146	75	68	-1	-9.3	1	80.49	9.3
145	88	68	9	-9.3	81	88.49	-88.7
144	75	93	-1	20.7	1	428.49	-20.7
143	88	68	9	-9.3	81	88.49	-88.7
142	75	75	-1	0.7	1	.49	-0.7
141	68	68	19	10.7	361	114.49	303.3
140	68	68	-11	-9.3	131	88.49	103.3
139	88	75	9	0.7	81	.49	9.3
138	75	75	-1	0.7	1	.49	-0.7
137	88	93	9	80.3	81	428.49	188.3
136	68	40	-11	-24.3	131	1178.49	377.3
135	88	68	9	10.7	81	114.49	93.3
134	75	88	-1	10.7	1	114.49	-10.7
133	75	88	-1	10.7	1	114.49	-10.7
132	68	68	9	-9.3	81	88.49	-88.7
131	75	68	-1	-9.3	1	88.49	9.3
130	75	60	-1	-24.3	1	890.49	84.3
129	75	68	-1	-9.3	1	88.49	9.3
128	75	68	-1	-9.3	1	88.49	9.3
127	75	68	-1	-9.3	1	88.49	9.3
126	88	88	9	10.7	81	114.49	93.3
125	75	75	-1	0.7	1	.49	-0.7
124	75	68	-1	-9.3	1	88.49	9.3
123	68	68	-11	-24.3	131	890.49	897.5
122	68	68	-11	-9.3	131	88.49	103.3
121	75	60	-1	-24.3	1	890.49	84.3
120	75	68	-1	-9.3	1	88.49	9.3
119	75	68	-1	10.7	1	114.49	-10.7
118	68	68	-11	-9.3	131	88.49	103.3
117	75	75	-1	0.7	1	.49	-0.7
116	75	75	-1	0.7	1	.49	-0.7
115	75	75	-1	0.7	1	.49	-0.7
114	75	68	-1	-24.3	1	890.49	84.3
113	75	68	-1	10.7	1	114.49	-10.7
112	75	68	-1	10.7	1	114.49	-10.7
111	68	68	9	-9.3	81	88.49	-88.7
110	68	75	-11	0.7	131	.49	-0.7
109	75	75	-1	0.7	1	.49	-0.7
108	75	68	-1	-24.3	1	890.49	84.3
107	75	68	-1	10.7	1	114.49	-10.7
106	75	68	-1	10.7	1	114.49	-10.7
105	68	68	9	-9.3	81	88.49	-88.7
104	68	75	-11	0.7	131	.49	-0.7
103	75	75	-1	0.7	1	.49	-0.7
102	75	68	-1	-24.3	1	890.49	84.3
101	75	68	-1	10.7	1	114.49	-10.7
100	75	68	-1	10.7	1	114.49	-10.7
99	68	68	9	-9.3	81	88.49	-88.7
98	68	75	-11	0.7	131	.49	-0.7
97	75	75	-1	0.7	1	.49	-0.7
96	75	68	-1	-24.3	1	890.49	84.3
95	75	68	-1	10.7	1	114.49	-10.7
94	75	68	-1	10.7	1	114.49	-10.7
93	68	68	9	-9.3	81	88.49	-88.7
92	68	75	-11	0.7	131	.49	-0.7
91	75	75	-1	0.7	1	.49	-0.7
90	75	68	-1	-24.3	1	890.49	84.3
89	75	68	-1	10.7	1	114.49	-10.7
88	75	68	-1	10.7	1	114.49	-10.7
87	68	68	9	-9.3	81	88.49	-88.7
86	68	75	-11	0.7	131	.49	-0.7
85	75	75	-1	0.7	1	.49	-0.7
84	75	68	-1	-24.3	1	890.49	84.3
83	75	68	-1	10.7	1	114.49	-10.7
82	75	68	-1	10.7	1	114.49	-10.7
81	68	68	9	-9.3	81	88.49	-88.7
80	68	75	-11	0.7	131	.49	-0.7
79	75	75	-1	0.7	1	.49	-0.7
78	75	68	-1	-24.3	1	890.49	84.3
77	75	68	-1	10.7	1	114.49	-10.7
76	75	68	-1	10.7	1	114.49	-10.7
75	68	68	9	-9.3	81	88.49	-88.7
74	68	75	-11	0.7	131	.49	-0.7
73	75	75	-1	0.7	1	.49	-0.7
72	75	68	-1	-24.3	1	890.49	84.3
71	75	68	-1	10.7	1	114.49	-10.7
70	75	68	-1	10.7	1	114.49	-10.7
69	68	68	9	-9.3	81	88.49	-88.7
68	68	75	-11	0.7	131	.49	-0.7
67	75	75	-1	0.7	1	.49	-0.7
66	75	68	-1	-24.3	1	890.49	84.3
65	75	68	-1	10.7	1	114.49	-10.7
64	75	68	-1	10.7	1	114.49	-10.7
63	68	68	9	-9.3	81	88.49	-88.7
62	68	75	-11	0.7	131	.49	-0.7
61	75	75	-1	0.7	1	.49	-0.7
60	75	68	-1	-24.3	1	890.49	84.3
59	75	68	-1	10.7	1	114.49	-10.7
58	75	68	-1	10.7	1	114.49	-10.7
57	68	68	9	-9.3	81	88.49	-88.7
56	68	75	-11	0.7	131	.49	-0.7
55	75	75	-1	0.7	1	.49	-0.7
54	75	68	-1	-24.3	1	890.49	84.3
53	75	68	-1	10.7	1	114.49	-10.7
52	75	68	-1	10.7	1	114.49	-10.7
51	68	68	9	-9.3	81	88.49	-88.7
50	68	75	-11	0.7	131	.49	-0.7
49	75	75	-1	0.7	1	.49	-0.7
48	75	68	-1	-24.3	1	890.49	84.3
47	75	68	-1	10.7	1	114.49	-10.7
46	75	68	-1	10.7	1	114.49	-10.7
45	68	68	9	-9.3	81	88.49	-88.7
44	68	75	-11	0.7	131	.49	-0.7
43	75	75	-1	0.7	1	.49	-0.7
42	75	68	-1	-24.3	1	890.49	84.3
41	75	68	-1	10.7	1	114.49	-10.7
40	75	68	-1	10.7	1	114.49	-10.7
39	68	68	9	-9.3	81	88.49	-88.7
38	68	75	-11	0.7	131	.49	-0.7
37	75	75	-1	0.7	1	.49	-0.7
36	75	68	-1	-24.3	1	890.49	84.3
35	75	68	-1	10.7	1	114.49	-10.7
34	75	68	-1	10.7	1	114.49	-10.7
33	68	68	9	-9.3	81	88.49	-88.7
32	68	75	-11	0.7	131	.49	-0.7
31	75	75	-1	0.7	1	.49	-0.7
30	75	68	-1	-24.3	1	890.49	84.3
29	75	68	-1	10.7	1	114.49	-10.7
28	75	68	-1	10.7	1	114.49	-10.7
27	68	68	9	-9.3	81	88.49	-88.7
26	68	75	-11	0.7	131	.49	-0.7
25	75	75	-1	0.7	1	.49	-0.7
24	75	68	-1	-24.3	1	890.49	84.3
23	75	68	-1	10.7	1	114.49	-10.7
22	75	68	-1	10.7	1	114.49	-10.7
21	68	68	9	-9.3	81	88.49	-88.7
20	68	75	-11	0.7	131	.49	-0.7
19	75	75	-1	-9.3	1	88.49	9.3

TABLE VIII a (1938)

No.	X	Y	x	y	x ²	y ²	xy
191	65	65	-11	- 9.3	121	86.49	102.3
192	85	85	9	10.7	81	114.49	96.3
193	75	85	- 1	10.7	1	114.49	- 10.7
194	65	65	-11	- 9.3	121	86.49	-102.3
195	75	85	- 1	10.7	1	114.49	- 10.7
196	85	85	9	10.7	81	114.49	96.3
197	65	75	-11	0.7	121	.49	- 7.7
198	75	40	- 1	-34.3	1	1176.49	34.3
199	65	75	-11	0.7	121	.49	- 7.7
200	65	65	-11	- 9.3	121	86.49	102.3
201	85	85	9	10.7	81	114.49	96.3
202	85	95	9	20.7	81	428.49	186.3
203	85	95	9	20.7	81	428.49	186.3
204	85	65	9	- 9.3	81	86.49	- 83.7
205	75	85	- 1	10.7	1	114.49	- 10.7
206	85	85	9	10.7	81	114.49	96.3
207	--	--	--	--	--	--	--
208	75	75	- 1	0.7	1	.49	- 0.7
209	75	65	- 1	- 9.3	1	86.49	9.3
210	95	95	9	20.7	81	428.49	186.3
211	65	65	-11	- 9.3	121	86.49	102.3
212	75	85	- 1	10.7	1	114.49	- 10.7
213	75	75	- 1	0.7	1	.49	- 0.7
214	75	65	- 1	- 9.3	1	86.49	9.3
215	65	65	-11	- 9.3	121	86.49	102.3
216	75	75	- 1	0.7	1	.49	- 0.7
217	85	95	9	20.7	81	428.49	186.3
218	85	75	9	0.7	81	.49	6.3
219	75	65	- 1	- 9.3	1	86.49	9.3
220	65	65	-11	- 9.3	121	86.49	102.3
221	85	75	9	0.7	81	.49	6.3
222	85	65	9	- 9.3	81	86.49	- 83.7
223	75	75	- 1	0.7	1	.49	- 0.7
224	65	65	-11	- 9.3	121	86.49	102.3
225	65	65	-11	- 9.3	121	86.49	102.3
226	65	85	-11	10.7	121	114.49	-117.7
227	65	50	-11	-24.3	121	590.49	267.3
228	65	50	-11	-24.3	121	590.49	267.3
229	95	85	19	10.7	361	114.49	203.3
230	65	95	-11	20.7	121	428.49	-227.7
231	85	85	9	10.7	81	114.49	96.3
232	75	75	- 1	0.7	1	.49	- 0.7
233	85	65	9	- 9.3	81	86.49	- 83.7
234	65	40	-11	-34.3	121	1176.49	377.3
235	65	85	-11	10.7	121	114.49	-117.7
236	75	75	- 1	0.7	1	.49	- 0.7
237	75	50	- 1	-24.3	1	590.49	24.3

TABLE VIII a (1931)

No.	X	Y	X	Y	X _s	Y _s	X _v
191	85	85	-11	-9.3	181	85.43	108.5
192	85	85	9	10.7	81	114.43	3.33
193	75	75	-1	10.7	1	114.43	-10.7
194	85	85	-11	-9.3	181	85.43	-108.5
195	75	75	-1	10.7	1	114.43	-10.7
196	85	85	9	10.7	81	114.43	3.33
197	85	85	-11	-9.3	181	85.43	-108.5
198	75	75	-1	10.7	1	114.43	-10.7
199	85	85	-11	-9.3	181	85.43	-108.5
200	85	85	-11	-9.3	181	85.43	-108.5
201	85	85	9	10.7	81	114.43	3.33
202	85	85	9	10.7	81	114.43	3.33
203	85	85	9	10.7	81	114.43	3.33
204	85	85	9	10.7	81	114.43	3.33
205	75	75	-1	10.7	1	114.43	-10.7
206	85	85	-1	10.7	81	114.43	3.33
207	--	--	--	--	--	--	--
208	75	75	-1	0.7	1	43.	-0.7
209	75	75	-1	-9.3	1	85.43	-9.3
210	95	95	9	20.7	81	488.43	188.5
211	85	85	-11	-9.3	181	85.43	-108.5
212	75	75	-1	10.7	1	114.43	-10.7
213	75	75	-1	0.7	1	43.	-0.7
214	75	75	-1	-9.3	1	85.43	-9.3
215	85	85	-11	-9.3	181	85.43	-108.5
216	75	75	-1	0.7	1	43.	-0.7
217	95	95	9	20.7	81	488.43	188.5
218	85	85	9	0.7	81	43.	0.3
219	75	75	-1	-9.3	1	85.43	-9.3
220	85	85	-11	-9.3	181	85.43	-108.5
221	85	75	9	0.7	81	43.	0.3
222	85	85	9	-9.3	81	85.43	-9.3
223	75	75	-1	0.7	1	43.	-0.7
224	85	85	-11	-9.3	181	85.43	-108.5
225	85	85	-11	-9.3	181	85.43	-108.5
226	85	85	-11	-9.3	181	85.43	-108.5
227	85	85	-11	-24.3	181	530.43	-237.5
228	85	85	-11	-24.3	181	530.43	-237.5
229	85	85	19	10.7	381	114.43	303.5
230	85	85	-11	20.7	181	488.43	-237.5
231	85	85	9	10.7	81	114.43	3.33
232	75	75	-1	0.7	1	43.	-0.7
233	85	85	9	-9.3	81	85.43	-9.3
234	85	85	-11	-24.3	181	530.43	-237.5
235	85	85	-11	-24.3	181	530.43	-237.5
236	85	85	-11	-24.3	181	530.43	-237.5
237	75	75	-1	0.7	1	43.	-0.7
238	85	85	-1	0.7	81	43.	0.3

TABLE VIII a (1938)

No.	X	Y	x	y	x ²	y ²	xy
238	75	50	- 1	-24.3	1	590.49	24.3
239	75	75	- 1	0.7	1	.49	- 0.7
227	17,250	17,075			13,877	48,402.96	12,575.2
	75.99	75.22					

Correlating:

$$r = \frac{\sum xy}{\sqrt{\sum x^2} \times \sqrt{\sum y^2}} = \frac{12,575.2}{\sqrt{13,877} \times \sqrt{48,402.96}}$$

$$= \frac{12,575.2}{117.8 \times 220.} = .485$$

$$P.E._r = \frac{.6745 \times (1-r^2)}{\sqrt{N}} = \frac{.6745 \times (1-.7648)}{\sqrt{227}}$$

$$= \frac{.5159}{15.06} = .034$$

1947.

(1938) 1111 1111

No.	X	Y	X	Y	X	Y
848	75	80	1	-84.8	1	80.000
849	75	75	1	0.7	1	0.49
850	75	75	1	0.7	1	0.49
851	75	75	1	0.7	1	0.49
852	75	75	1	0.7	1	0.49
853	75	75	1	0.7	1	0.49
854	75	75	1	0.7	1	0.49
855	75	75	1	0.7	1	0.49
856	75	75	1	0.7	1	0.49
857	75	75	1	0.7	1	0.49
858	75	75	1	0.7	1	0.49
859	75	75	1	0.7	1	0.49
860	75	75	1	0.7	1	0.49
861	75	75	1	0.7	1	0.49
862	75	75	1	0.7	1	0.49
863	75	75	1	0.7	1	0.49
864	75	75	1	0.7	1	0.49
865	75	75	1	0.7	1	0.49
866	75	75	1	0.7	1	0.49
867	75	75	1	0.7	1	0.49
868	75	75	1	0.7	1	0.49
869	75	75	1	0.7	1	0.49
870	75	75	1	0.7	1	0.49
871	75	75	1	0.7	1	0.49
872	75	75	1	0.7	1	0.49
873	75	75	1	0.7	1	0.49
874	75	75	1	0.7	1	0.49
875	75	75	1	0.7	1	0.49
876	75	75	1	0.7	1	0.49
877	75	75	1	0.7	1	0.49
878	75	75	1	0.7	1	0.49
879	75	75	1	0.7	1	0.49
880	75	75	1	0.7	1	0.49
881	75	75	1	0.7	1	0.49
882	75	75	1	0.7	1	0.49
883	75	75	1	0.7	1	0.49
884	75	75	1	0.7	1	0.49
885	75	75	1	0.7	1	0.49
886	75	75	1	0.7	1	0.49
887	75	75	1	0.7	1	0.49
888	75	75	1	0.7	1	0.49
889	75	75	1	0.7	1	0.49
890	75	75	1	0.7	1	0.49
891	75	75	1	0.7	1	0.49
892	75	75	1	0.7	1	0.49
893	75	75	1	0.7	1	0.49
894	75	75	1	0.7	1	0.49
895	75	75	1	0.7	1	0.49
896	75	75	1	0.7	1	0.49
897	75	75	1	0.7	1	0.49
898	75	75	1	0.7	1	0.49
899	75	75	1	0.7	1	0.49
900	75	75	1	0.7	1	0.49

Correlation:

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}} = \frac{18,875.81}{\sqrt{13,877 \times 48,402.95}} = 0.403$$

$$F.E. = \frac{(1-r) \sqrt{1-r^2}}{\sqrt{n}} = \frac{(1-0.403) \sqrt{1-0.403^2}}{\sqrt{100}} = 0.034$$

$$100 \times 0.034 = 3.4$$

TABLE VIII b (1937)

Correlation of High School Average and Algebra Final Grade

No.	X	Y	x	y	x ²	y ²	xy
1	75	Same as	- 2.7	- 9.7	7.29	Same as	26.19
2	75	III b	- 2.7	.3	7.29	III b	- .81
3	85		7.3	.3	53.29		2.19
4	85		7.3	20.3	53.29		148.19
5	85		7.3	.3	53.29		2.19
6	85		7.3	10.3	53.29		15.19
7	65		-12.7	-24.7	161.29		313.69
8	85		7.3	.3	53.29		2.19
9	75		- 2.7	10.3	7.29		- 27.81
10	65		-12.7	-39.7	161.29		504.19
11	85		7.3	.3	53.29		2.19
12	65		-12.7	.3	161.29		- 3.81
13	75		- 2.7	10.3	7.29		- 27.81
14	85		7.3	- 9.7	53.29		- 70.81
15	85		7.3	10.3	53.29		75.19
16	65		-12.7	.3	161.29		- 3.81
17	75		- 2.7	.3	7.29		- .81
18	95		17.3	10.3	299.29		178.19
19	75		- 2.7	.3	7.29		- .81
20	75		- 2.7	- 9.7	7.29		26.19
21	85		7.3	20.3	53.29		148.19
22	85		7.3	10.3	53.29		75.19
23	85		7.3	10.3	53.29		75.19
24	85		7.3	- 9.7	53.29		- 70.81
25	75		- 2.7	.3	7.29		- .81
26	85		7.3	10.3	53.29		75.19
27	75		- 2.7	-24.7	7.29		66.69
28	75		- 2.7	10.3	7.29		- 27.81
29	75		- 2.7	-24.7	7.29		66.69
30	75		- 2.7	10.3	7.29		- 27.81
31	65		-12.7	-24.7	161.29		313.69
32	75		- 2.7	10.3	7.29		- 27.81
33	85		7.3	.3	53.29		2.19
34	85		7.3	10.3	53.29		75.19
35	85		7.3	10.3	53.29		75.19
36	75		- 2.7	- 9.7	7.29		26.19
37	65		-12.7	10.3	161.29		-130.81
38	85		7.3	- 9.7	53.29		- 70.81
39	65		-12.7	.3	7.29		- 3.81
40	85		7.3	.3	53.29		2.19
41	85		7.3	- 9.7	53.29		- 70.81
42	65		-12.7	.3	161.29		- 3.81
43	75		- 2.7	10.3	7.29		- 27.81
44	95		17.3	10.3	299.29		178.19
45	85		7.3	10.3	53.29		75.19
46	75		- 2.7	.3	7.29		- .81

TABLE VIII b (1937)

Correlation of High School Average and Algebra Final Grade

No.	X	Y	X	Y	X	Y	X ²	Y ²	XY
1	75	Same as	- 2.7	- 2.7	- 9.7	7.29	Same as	26.19	
2	76	III b	- 2.7	- 2.7	3.	7.29	III b	- .81	
3	86		7.3	7.3	3.	86.29		2.19	
4	86		7.3	7.3	20.3	86.29		148.19	
5	86		7.3	7.3	3.	86.29		2.19	
6	86		7.3	7.3	10.3	86.29		16.19	
7	86		-12.7	-12.7	-24.7	161.29		213.89	
8	86		7.3	7.3	3.	86.29		2.19	
9	76		- 2.7	- 2.7	10.3	7.29		- 27.81	
10	86		-12.7	-12.7	-24.7	161.29		204.19	
11	86		7.3	7.3	3.	86.29		2.19	
12	86		-12.7	-12.7	3.	161.29		- 27.81	
13	76		- 2.7	- 2.7	10.3	7.29		- 27.81	
14	86		7.3	7.3	- 9.7	86.29		- 70.81	
15	86		7.3	7.3	10.3	86.29		75.19	
16	86		-12.7	-12.7	3.	161.29		- 27.81	
17	76		- 2.7	- 2.7	3.	7.29		- .81	
18	95		17.3	17.3	10.3	299.29		178.19	
19	76		- 2.7	- 2.7	3.	7.29		- .81	
20	76		- 2.7	- 2.7	- 9.7	7.29		- 26.19	
21	86		7.3	7.3	20.3	86.29		148.19	
22	86		7.3	7.3	10.3	86.29		75.19	
23	86		7.3	7.3	10.3	86.29		75.19	
24	86		7.3	7.3	- 9.7	86.29		- 70.81	
25	76		- 2.7	- 2.7	3.	7.29		- .81	
26	86		7.3	7.3	10.3	86.29		75.19	
27	76		- 2.7	- 2.7	-24.7	7.29		- 27.81	
28	76		- 2.7	- 2.7	10.3	7.29		- 27.81	
29	76		- 2.7	- 2.7	-24.7	7.29		- 27.81	
30	76		- 2.7	- 2.7	10.3	7.29		- 27.81	
31	86		-12.7	-12.7	-24.7	161.29		213.89	
32	76		- 2.7	- 2.7	10.3	7.29		- 27.81	
33	86		7.3	7.3	3.	86.29		2.19	
34	86		7.3	7.3	10.3	86.29		75.19	
35	86		7.3	7.3	10.3	86.29		75.19	
36	76		- 2.7	- 2.7	- 9.7	7.29		- 26.19	
37	86		-12.7	-12.7	10.3	161.29		-120.81	
38	86		7.3	7.3	- 9.7	86.29		- 70.81	
39	86		-12.7	-12.7	3.	7.29		- 27.81	
40	86		7.3	7.3	3.	86.29		2.19	
41	86		7.3	7.3	- 9.7	86.29		- 70.81	
42	86		-12.7	-12.7	3.	161.29		- 27.81	
43	76		- 2.7	- 2.7	10.3	7.29		- 27.81	
44	95		17.3	17.3	10.3	299.29		178.19	
45	86		7.3	7.3	10.3	86.29		75.19	
46	76		- 2.7	- 2.7	3.	7.29		- .81	

TABLE VIII b (1937)

No.	X	Y	x	y	x ²	y ²	xy
47	65	Same as	-12.7	- 9.7	161.29	Same as	129.19
48	85	III b	7.3	- 9.7	53.29	III b	- 70.81
49	65		-12.7	- 9.7	161.29		129.19
50	65		-12.7	- 9.7	161.29		129.19
51	--		---	---	---		----
52	75		- 2.7	20.3	7.29		- 54.81
53	85		7.3	- 9.7	53.29		- 70.81
54	75		- 2.7	-24.7	7.29		66.69
55	65		-12.7	- 9.7	161.29		129.19
56	65		-12.7	20.3	161.29		-257.81
57	75		- 2.7	10.3	7.29		- 27.81
58	85		7.3	10.3	53.29		75.19
59	75		- 2.7	.3	7.29		- .81
60	75		- 2.7	-24.7	7.29		66.69
61	85		7.3	10.3	53.29		75.19
62	85		7.3	10.3	53.29		75.19
63	85		7.3	10.3	53.29		75.19
64	85		7.3	10.3	53.29		75.19
65	--		---	---	---		----
66	65		-12.7	- 9.7	161.29		129.19
67	95		17.3	20.3	299.29		351.19
68	65		-12.7	.3	161.29		- 3.81
69	85		7.3	- 9.7	53.29		- 70.81
70	85		7.3	10.3	53.29		75.19
71	65		-12.7	-24.7	161.29		313.69
72	65		-12.7	20.3	161.29		-257.81
73	75		- 2.7	- 9.7	7.29		26.19
74	75		- 2.7	.3	7.29		- .81
75	85		7.3	10.3	53.29		75.19
76	95		17.3	.3	299.29		5.19
77	75		- 2.7	- 9.7	7.29		26.19
78	65		-12.7	.3	161.29		- 3.81
79	85		7.3	.3	53.29		2.19
80	65		-12.7	- 9.7	161.29		129.19
81	65		-12.7	- 9.7	161.29		129.19
82	75		- 2.7	- 9.7	7.29		26.19
83	85		7.3	10.3	53.29		75.19
84	75		- 2.7	- 9.7	7.29		26.19
85	85		7.3	20.3	53.29		148.19
86	75		- 2.7	10.3	7.29		- 27.81
87	85		7.3	20.3	53.29		148.19
88	85		7.3	.3	53.29		2.19
89	85		7.3	-24.7	53.29		-180.31
90	75		- 2.7	.3	7.29		- .81
91	65		-12.7	10.3	161.29		-130.81
92	65		-12.7	-39.7	161.29		504.19
93	75		- 2.7	10.3	7.29		- 27.81
94	75		- 2.7	- 9.7	7.29		26.19

TABLE VIII b-3 (1937)

No.	X	Y	X	Y	X	Y	X	Y
47	65	Same as-12.7	- 2.7	161.22	Same as	122.12		
48	65	111.0	- 2.7	52.22	111.0	- 70.61		
49	65	-12.7	- 2.7	161.22		122.12		
50	65	-12.7	- 2.7	161.22		122.12		
51	--	--	--	--		--		
52	75	- 2.7	20.2	7.22		- 24.61		
53	65	7.2	- 2.7	52.22		- 70.61		
54	75	- 2.7	-24.7	7.22		66.62		
55	65	-12.7	- 2.7	161.22		122.12		
56	65	-12.7	20.2	161.22		-22.7.61		
57	75	- 2.7	10.2	7.22		- 27.61		
58	65	7.2	10.2	52.22		75.12		
59	75	- 2.7	2	7.22		61		
60	75	- 2.7	-24.7	7.22		66.62		
61	65	7.2	10.2	52.22		75.12		
62	65	7.2	10.2	52.22		75.12		
63	65	7.2	10.2	52.22		75.12		
64	65	7.2	10.2	52.22		75.12		
65	--	--	--	--		--		
66	65	-12.7	- 2.7	161.22		122.12		
67	65	17.2	20.2	222.22		221.12		
68	65	-12.7	2	161.22		2.61		
69	65	7.2	- 2.7	52.22		- 70.61		
70	65	7.2	10.2	52.22		75.12		
71	65	-12.7	-24.7	161.22		212.62		
72	65	-12.7	20.2	161.22		-22.7.61		
73	75	- 2.7	- 2.7	7.22		22.12		
74	75	- 2.7	2	7.22		61		
75	65	7.2	10.2	52.22		75.12		
76	65	17.2	2	222.22		2.12		
77	75	- 2.7	- 2.7	7.22		22.12		
78	65	-12.7	2	161.22		- 2.61		
79	65	7.2	2	52.22		2.12		
80	65	-12.7	- 2.7	161.22		122.12		
81	65	-12.7	- 2.7	161.22		122.12		
82	75	- 2.7	- 2.7	7.22		22.12		
83	65	7.2	10.2	52.22		75.12		
84	75	- 2.7	- 2.7	7.22		22.12		
85	65	7.2	20.2	52.22		142.12		
86	75	- 2.7	10.2	7.22		- 27.61		
87	65	7.2	20.2	52.22		142.12		
88	65	7.2	2	52.22		2.12		
89	65	7.2	-24.7	52.22		-120.21		
90	75	- 2.7	2	7.22		61		
91	65	-12.7	10.2	161.22		-120.61		
92	65	-12.7	-22.7	161.22		204.12		
93	75	- 2.7	10.2	7.22		- 27.61		
94	75	- 2.7	- 2.7	7.22		22.12		

TABLE VIII b (1937)

No.	X	Y	x	y	x ²	y ²	xy
95	75	Same as	- 2.7	20.3	7.29	Same as	- 54.81
96	75	III b	- 2.7	.3	7.29	III b	- .81
97	85		7.3	- 9.7	53.29		- 70.81
98	85		7.3	10.3	53.29		75.19
99	75		- 2.7	.3	7.29		- .81
100	85		7.3	20.3	53.29		148.19
101	85		7.3	.3	53.29		2.19
102	75		- 2.7	10.3	7.29		- 27.81
103	75		- 2.7	20.3	7.29		- 54.81
104	85		7.3	.3	53.29		2.19
105	75		- 2.7	10.3	7.29		- 27.81
106	75		- 2.7	10.3	7.29		- 27.81
107	75		- 2.7	- 9.7	7.29		26.19
108	85		7.3	20.3	53.29		148.19
109	75		- 2.7	- 9.7	7.29		26.19
110	75		- 2.7	- 9.7	7.29		26.19
111	85		7.3	10.3	53.29		75.19
112	75		- 2.7	.3	7.29		- .81
113	75		- 2.7	- 9.7	7.29		26.19
114	85		7.3	20.3	53.29		148.19
115	85		7.3	10.3	53.29		75.19
116	75		- 2.7	.3	7.29		- .81
117	65		-12.7	- 9.7	161.29		129.19
118	85		7.3	-24.7	53.29		-180.31
119	75		- 2.7	20.3	7.29		- 54.81
120	95		17.3	.3	299.29		5.19
121	75		- 2.7	- 9.7	7.29		26.19
122	65		-12.7	-29.7	161.29		504.19
123	85		7.3	.3	53.29		2.19
124	75		- 2.7	10.3	7.29		- 27.81
125	75		- 2.7	- 9.7	7.29		26.19
126	75		- 2.7	10.3	7.29		- 27.81
127	75		- 2.7	10.3	7.29		- 27.81
128	85		7.3	10.3	53.29		75.19
129	65		-12.7	10.3	161.29		-130.81
130	75		- 2.7	10.3	7.29		- 27.81
131	75		- 2.7	-24.7	7.29		66.69
132	85		7.3	20.3	53.29		148.19
133	65		-12.7	- 9.7	161.29		129.19
134	75		- 2.7	.3	7.29		- .81
135	85		7.3	10.3	53.29		75.19
136	85		7.3	20.3	53.29		148.19
137	65		-12.7	-24.7	161.29		313.69
138	75		- 2.7	- 9.7	7.29		26.19
139	75		- 2.7	10.3	7.29		- 27.81
140	75		- 2.7	- 9.7	7.29		26.19
141	75		- 2.7	.3	7.29		- .81
142	75		- 2.7	- 9.7	7.29		26.19

TABLE VIII
(1927)

No.	1	2	3	4	5	6	7
142	75	-	2.7	-	9.7	7.22	23.12
141	75	-	2.7	-	8	7.22	23.12
140	75	-	2.7	-	9.7	7.22	23.12
139	75	-	2.7	-	10.2	7.22	23.12
138	75	-	2.7	-	9.7	7.22	23.12
137	75	-	2.7	-	10.2	7.22	23.12
136	75	-	2.7	-	9.7	7.22	23.12
135	75	-	2.7	-	9.7	7.22	23.12
134	75	-	2.7	-	10.2	7.22	23.12
133	85	-	7.2	-	8	23.22	23.12
132	85	-	7.2	-	8	23.22	23.12
131	75	-	2.7	-	24.7	7.22	23.22
130	75	-	2.7	-	10.2	7.22	23.12
129	65	-	12.7	-	9.7	151.22	23.12
128	65	-	12.7	-	22.7	151.22	23.12
127	75	-	2.7	-	9.7	7.22	23.12
126	75	-	2.7	-	9.7	7.22	23.12
125	75	-	2.7	-	9.7	7.22	23.12
124	75	-	2.7	-	10.2	7.22	23.12
123	85	-	7.2	-	8	23.22	23.12
122	85	-	7.2	-	8	23.22	23.12
121	75	-	2.7	-	24.7	7.22	23.22
120	75	-	2.7	-	10.2	7.22	23.12
119	75	-	2.7	-	9.7	7.22	23.12
118	85	-	7.2	-	24.7	23.22	23.12
117	65	-	12.7	-	9.7	151.22	23.12
116	75	-	2.7	-	8	7.22	23.12
115	85	-	7.2	-	10.2	23.22	23.12
114	85	-	7.2	-	20.2	23.22	23.12
113	75	-	2.7	-	9.7	7.22	23.12
112	75	-	2.7	-	8	7.22	23.12
111	85	-	7.2	-	10.2	23.22	23.12
110	75	-	2.7	-	9.7	7.22	23.12
109	75	-	2.7	-	9.7	7.22	23.12
108	85	-	7.2	-	20.2	23.22	23.12
107	75	-	2.7	-	9.7	7.22	23.12
106	75	-	2.7	-	10.2	7.22	23.12
105	75	-	2.7	-	10.2	7.22	23.12
104	85	-	7.2	-	8	23.22	23.12
103	75	-	2.7	-	20.2	7.22	23.12
102	75	-	2.7	-	10.2	7.22	23.12
101	85	-	7.2	-	8	23.22	23.12
100	85	-	7.2	-	20.2	23.22	23.12
99	75	-	2.7	-	8	7.22	23.12
98	85	-	7.2	-	10.2	23.22	23.12
97	85	-	7.2	-	9.7	23.22	23.12
96	75	-	2.7	-	8	7.22	23.12
95	75	-	2.7	-	24.7	7.22	23.22
94	75	-	2.7	-	9.7	7.22	23.12
93	75	-	2.7	-	9.7	7.22	23.12
92	75	-	2.7	-	9.7	7.22	23.12
91	75	-	2.7	-	9.7	7.22	23.12
90	75	-	2.7	-	9.7	7.22	23.12
89	75	-	2.7	-	9.7	7.22	23.12
88	75	-	2.7	-	9.7	7.22	23.12
87	75	-	2.7	-	9.7	7.22	23.12
86	75	-	2.7	-	9.7	7.22	23.12
85	75	-	2.7	-	9.7	7.22	23.12
84	75	-	2.7	-	9.7	7.22	23.12
83	75	-	2.7	-	9.7	7.22	23.12
82	75	-	2.7	-	9.7	7.22	23.12
81	75	-	2.7	-	9.7	7.22	23.12
80	75	-	2.7	-	9.7	7.22	23.12
79	75	-	2.7	-	9.7	7.22	23.12
78	75	-	2.7	-	9.7	7.22	23.12
77	75	-	2.7	-	9.7	7.22	23.12
76	75	-	2.7	-	9.7	7.22	23.12
75	75	-	2.7	-	9.7	7.22	23.12
74	75	-	2.7	-	9.7	7.22	23.12
73	75	-	2.7	-	9.7	7.22	23.12
72	75	-	2.7	-	9.7	7.22	23.12
71	75	-	2.7	-	9.7	7.22	23.12
70	75	-	2.7	-	9.7	7.22	23.12
69	75	-	2.7	-	9.7	7.22	23.12
68	75	-	2.7	-	9.7	7.22	23.12
67	75	-	2.7	-	9.7	7.22	23.12
66	75	-	2.7	-	9.7	7.22	23.12
65	75	-	2.7	-	9.7	7.22	23.12
64	75	-	2.7	-	9.7	7.22	23.12
63	75	-	2.7	-	9.7	7.22	23.12
62	75	-	2.7	-	9.7	7.22	23.12
61	75	-	2.7	-	9.7	7.22	23.12
60	75	-	2.7	-	9.7	7.22	23.12
59	75	-	2.7	-	9.7	7.22	23.12
58	75	-	2.7	-	9.7	7.22	23.12
57	75	-	2.7	-	9.7	7.22	23.12
56	75	-	2.7	-	9.7	7.22	23.12
55	75	-	2.7	-	9.7	7.22	23.12
54	75	-	2.7	-	9.7	7.22	23.12
53	75	-	2.7	-	9.7	7.22	23.12
52	75	-	2.7	-	9.7	7.22	23.12
51	75	-	2.7	-	9.7	7.22	23.12
50	75	-	2.7	-	9.7	7.22	23.12
49	75	-	2.7	-	9.7	7.22	23.12
48	75	-	2.7	-	9.7	7.22	23.12
47	75	-	2.7	-	9.7	7.22	23.12
46	75	-	2.7	-	9.7	7.22	23.12
45	75	-	2.7	-	9.7	7.22	23.12
44	75	-	2.7	-	9.7	7.22	23.12
43	75	-	2.7	-	9.7	7.22	23.12
42	75	-	2.7	-	9.7	7.22	23.12
41	75	-	2.7	-	9.7	7.22	23.12
40	75	-	2.7	-	9.7	7.22	23.12
39	75	-	2.7	-	9.7	7.22	23.12
38	75	-	2.7	-	9.7	7.22	23.12
37	75	-	2.7	-	9.7	7.22	23.12
36	75	-	2.7	-	9.7	7.22	23.12
35	75	-	2.7	-	9.7	7.22	23.12
34	75	-	2.7	-	9.7	7.22	23.12
33	75	-	2.7	-	9.7	7.22	23.12
32	75	-	2.7	-	9.7	7.22	23.12
31	75	-	2.7	-	9.7	7.22	23.12
30	75	-	2.7	-	9.7	7.22	23.12
29	75	-	2.7	-	9.7	7.22	23.12
28	75	-	2.7	-	9.7	7.22	23.12
27	75	-	2.7	-	9.7	7.22	23.12
26	75	-	2.7	-	9.7	7.22	23.12
25	75	-	2.7	-	9.7	7.22	23.12
24	75	-	2.7	-	9.7	7.22	23.12
23	75	-	2.7	-	9.7	7.22	23.12
22	75	-	2.7	-	9.7	7.22	23.12
21	75	-	2.7	-	9.7	7.22	23.12
20	75	-	2.7	-	9.7	7.22	23.12
19	75	-	2.7	-	9.7	7.22	23.12
18	75	-	2.7	-	9.7	7.22	23.12
17	75	-	2.7	-	9.7	7.22	23.12
16	75	-	2.7	-	9.7	7.22	23.12
15	75	-	2.7	-	9.7	7.22	23.12
14	75	-	2.7	-	9.7	7.22	23.12
13	75	-	2.7	-	9.7	7.22	23.12
12	75	-	2.7	-	9.7	7.22	23.12
11	75	-	2.7	-	9.7	7.22	23.12
10	75	-	2.7	-	9.7	7.22	23.12
9	75	-	2.7	-	9.7	7.22	23.12
8	75	-	2.7	-	9.7	7.22	23.12
7	75	-	2.7	-	9.7	7.22	23.12
6	75	-	2.7	-	9.7	7.22	23.12
5	75	-	2.7	-	9.7	7.22	23.12
4	75	-	2.7	-	9.7	7.22	23.12
3	75	-	2.7	-	9.7	7.22	23.12
2	75	-	2.7	-	9.7	7.22	23.12
1	75	-	2.7	-	9.7	7.22	23.12

TABLE VIII b (1937)

No.	X	Y	x	y	x ²	y ²	xy
143	85	Same as	7.3	20.3	53.29	Same as	148.19
144	75	III b	- 2.7	20.3	7.29	III b	- 54.81
145	65		-12.7	10.3	161.29		-130.81
146	65		-12.7	10.3	161.29		-130.81
147	75		- 2.7	.3	7.29		- .81
148	65		-12.7	- 9.7	161.29		129.19
149	65		-12.7	.3	161.29		- 3.81
150	--		--	--	---		----
151	85		7.3	.3	53.29		2.19
152	85		7.3	.3	53.29		2.19
153	75		- 2.7	10.3	7.29		- 27.81
154	85		7.3	10.3	53.29		75.19
155	85		7.3	.3	53.29		2.19
156	75		- 2.7	10.3	7.29		- 27.81
157	75		- 2.7	.3	7.29		- .81
158	75		- 2.7	.3	7.29		- .81
159	85		7.3	.3	53.29		2.19
160	85		7.3	.3	53.29		2.19
161	95		17.3	10.3	299.29		178.19
162	75		- 2.7	.3	7.29		- .81
163	85		7.3	.3	53.29		2.19
164	75		- 2.7	-24.7	7.29		66.69
165	65		-12.7	-24.7	161.29		313.69
166	65		-12.7	.3	161.29		- 3.81
167	75		- 2.7	-29.7	7.29		66.69
168	95		17.3	20.3	299.29		351.19
169	65		-12.7	.3	161.29		- 3.81
170	85		7.3	10.3	53.29		75.19
171	75		- 2.7	10.3	7.29		- 27.81
172	85		7.3	20.3	53.29		148.19
173	75		- 2.7	- 9.7	7.29		26.19
174	65		-12.7	.3	161.29		- 3.81
175	75		- 2.7	10.3	7.29		- 27.81
176	75		- 2.7	- 9.7	7.29		26.19
177	75		- 2.7	10.3	7.29		- 27.81
178	75		- 2.7	- 9.7	7.29		26.19
179	85		7.3	10.3	53.29		75.19
180	85		7.3	10.3	53.29		75.19
181	75		- 2.7	10.3	7.29		- 27.81
182	75		- 2.7	10.3	7.29		- 27.81
183	75		- 2.7	.3	7.29		- .81
184	85		7.3	- 9.7	53.29		- 70.81
185	85		7.3	10.3	53.29		75.19
186	75		- 2.7	.3	7.29		- .81
187	75		- 2.7	10.3	7.29		- 27.81
188	95		17.3	10.3	299.29		178.19
189	75		- 2.7	10.3	7.29		- 27.81
190	85		7.3	20.3	53.29		148.19

TABLE VIII (1937)

No.	X	Y	Z	V	W	X
141	88	Same as	7.3	20.3	23.23	148.19
142	75	111 p	- 2.7	20.3	7.23	149.81
143	88		-12.7	10.3	161.23	-150.81
144	88		-12.7	10.3	161.23	-150.81
145	75		- 2.7	2	7.23	- 81
146	88		-12.7	- 2.7	161.23	159.19
147	88		-12.7	2	161.23	- 2.81
148	88		---	---	---	---
149	88		7.3	2	23.23	2.19
150	88		7.3	2	23.23	2.19
151	75		- 2.7	10.3	7.23	- 27.81
152	88		7.3	10.3	23.23	75.19
153	88		7.3	2	23.23	2.19
154	75		- 2.7	10.3	7.23	- 27.81
155	88		7.3	2	23.23	2.19
156	75		- 2.7	10.3	7.23	- 27.81
157	75		- 2.7	2	7.23	81
158	75		- 2.7	2	7.23	81
159	88		7.3	2	23.23	2.19
160	88		7.3	2	23.23	2.19
161	95		17.3	10.3	239.23	178.19
162	75		- 2.7	2	7.23	- 81
163	88		7.3	2	23.23	2.19
164	75		- 2.7	-24.7	7.23	22.23
165	88		-12.7	-24.7	161.23	212.23
166	88		-12.7	2	161.23	- 2.81
167	75		- 2.7	-24.7	7.23	22.23
168	95		17.3	20.3	239.23	221.19
169	88		-12.7	2	161.23	- 2.81
170	88		7.3	10.3	23.23	75.19
171	75		- 2.7	10.3	7.23	- 27.81
172	88		7.3	20.3	23.23	148.19
173	75		- 2.7	- 2.7	7.23	22.19
174	88		-12.7	2	161.23	- 2.81
175	75		- 2.7	10.3	7.23	- 27.81
176	75		- 2.7	- 2.7	7.23	22.19
177	75		- 2.7	10.3	7.23	- 27.81
178	75		- 2.7	- 2.7	7.23	22.19
179	88		7.3	10.3	23.23	75.19
180	88		7.3	10.3	23.23	75.19
181	75		- 2.7	10.3	7.23	- 27.81
182	75		- 2.7	10.3	7.23	- 27.81
183	75		- 2.7	2	7.23	81
184	88		7.3	- 2.7	23.23	- 20.81
185	88		7.3	10.3	23.23	75.19
186	75		- 2.7	2	7.23	81
187	75		- 2.7	10.3	7.23	- 27.81
188	95		17.3	10.3	239.23	178.19
189	75		- 2.7	10.3	7.23	- 27.81
190	88		7.3	20.3	23.23	148.19

TABLE VIII b (1937)

No.	X	Y	x	y	x ²	y ²	xy
191	95	Same as	17.3	10.3	299.29	Same as	178.19
192	75	III b	- 2.7	-24.7	7.29	III b	66.69
193	75		- 2.7	-24.7	7.29		66.69
194	85		7.3	10.3	53.29		75.19
195	75		- 2.7	.3	7.29		- .81
196	65		-12.7	.3	161.29		- 3.81
197	85		7.3	- 9.7	53.29		- 70.81
198	75		- 2.7	.3	7.29		- .81
199	85		7.3	20.3	53.29		148.19
200	65		-12.7	- 9.7	161.29		129.19
201	75		- 2.7	-24.7	7.29		66.69
202	75		- 2.7	.3	7.29		- .81
203	85		7.3	.3	53.29		2.19
204	85		7.3	20.3	53.29		148.19
205	85		7.3	10.3	53.29		75.19
206	75		- 2.7	- 9.7	7.29		26.19
207	85		7.3	10.3	53.29		75.19
208	75		- 2.7	- 9.7	7.29		26.19
209	85		7.3	20.3	53.29		148.19
210	75		- 2.7	10.3	7.29		- 27.81
211	85		7.3	.3	53.29		2.19
212	75		- 2.7	10.3	7.29		- 27.81
213	75		- 2.7	10.3	7.29		- 27.81
214	95		17.3	10.3	299.29		178.19
215	85		7.3	- 9.7	53.29		- 70.81
216	75		- 2.7	10.3	7.29		- 27.81
217	75		- 2.7	- 9.7	7.29		26.19
218	85		7.3	20.3	53.29		148.19
219	75		- 2.7	- 9.7	7.29		26.19
220	95		17.3	10.3	299.29		178.19
221	65		-12.7	.3	161.29		- 3.81
222	85		7.3	10.3	53.29		75.19
223	65		-12.7	10.3	161.29		-130.81
224	85		7.3	- 9.7	53.29		- 70.81
225	65		-12.7	10.3	161.29		-130.81
226	65		-12.7	-24.7	161.29		313.69
227	85		7.3	10.3	53.29		75.19
228	95		17.3	10.3	299.29		178.19
229	--		---	---	---		----
230	75		- 2.7	10.3	7.29		- 27.81
231	75		- 2.7	-24.7	7.29		66.69
232	75		- 2.7	-24.7	7.29		66.69
233	75		- 2.7	.3	7.29		- .81
234	75		- 2.7	10.3	7.29		- 27.81
235	75		- 2.7	10.3	7.29		- 27.81
236	85		7.3	10.3	53.29		75.19
237	75		- 2.7	- 9.7	7.29		26.19
238	65		-12.7	10.3	161.29		-130.81

TABLE VIII b (1937)

No.	X	Y	Z	V	X	Y	X _Y
191	95	Same as	17.3	10.3	299.39	Same as	178.19
192	75	111 p	- 3.7	-24.7	7.39	111 p	66.69
193	75	- 3.7	-24.7	7.39	7.39		66.69
194	85	7.3	10.3	299.39	7.39		78.19
195	75	- 3.7	3.	7.39	7.39		.31
196	65	-13.7	3.	161.39	161.39		- 3.31
197	65	7.3	- 9.9	53.39	53.39		- 70.81
198	75	- 3.7	3.	7.39	7.39		.31
199	65	7.3	20.3	53.39	53.39		148.19
200	65	-13.7	- 9.7	161.39	161.39		129.19
201	75	- 3.7	-24.7	7.39	7.39		66.69
202	75	- 3.7	3.	7.39	7.39		.31
203	85	7.3	3.	53.39	53.39		3.19
204	65	7.3	20.3	53.39	53.39		148.19
205	65	7.3	10.3	299.39	299.39		78.19
206	75	- 3.7	- 9.7	7.39	7.39		26.19
207	65	7.3	10.3	299.39	299.39		78.19
208	75	- 3.7	- 9.7	7.39	7.39		26.19
209	85	7.3	20.3	53.39	53.39		148.19
210	75	- 3.7	10.3	7.39	7.39		- 27.81
211	65	7.3	3.	53.39	53.39		3.19
212	75	- 3.7	10.3	7.39	7.39		- 27.81
213	75	- 3.7	10.3	7.39	7.39		- 27.81
214	95	17.3	10.3	299.39	299.39		178.19
215	65	7.3	- 9.7	53.39	53.39		- 70.81
216	75	- 3.7	10.3	7.39	7.39		- 27.81
217	75	- 3.7	- 9.7	7.39	7.39		26.19
218	85	7.3	20.3	53.39	53.39		148.19
219	75	- 3.7	- 9.7	7.39	7.39		26.19
220	95	17.3	10.3	299.39	299.39		178.19
221	65	-13.7	3.	161.39	161.39		- 3.31
222	65	7.3	10.3	299.39	299.39		78.19
223	65	-13.7	10.3	161.39	161.39		-130.81
224	65	7.3	- 9.7	53.39	53.39		- 70.81
225	65	-13.7	10.3	161.39	161.39		-130.81
226	65	-13.7	-24.7	161.39	161.39		213.69
227	85	7.3	10.3	299.39	299.39		78.19
228	95	17.3	10.3	299.39	299.39		178.19
229	--	--	--	--	--		--
230	75	- 3.7	10.3	7.39	7.39		- 27.81
231	75	- 3.7	-24.7	7.39	7.39		66.69
232	75	- 3.7	-24.7	7.39	7.39		66.69
233	75	- 3.7	3.	7.39	7.39		.31
234	75	- 3.7	10.3	7.39	7.39		- 27.81
235	75	- 3.7	10.3	7.39	7.39		- 27.81
236	85	7.3	10.3	299.39	299.39		78.19
237	75	- 3.7	- 9.7	7.39	7.39		26.19
238	65	-13.7	10.3	161.39	161.39		-130.81

TABLE VIII b (1937)

No.	X	Y	x	y	x ²	y ²	xy
239	85	Same as	7.3	10.3	53.29	Same as	75.19
240	85	III b	7.3	.3	53.29	III b	2.19
241	85		7.3	20.3	53.29		148.19
242	85		7.3	- 9.7	53.29		- 70.81
243	85		7.3	20.3	53.29		148.19
244	75		- 2.7	10.3	7.29		- 27.81
245	75		- 2.7	.3	7.29		- .81
246	75		- 2.7	10.3	7.29		- 27.81
247	75		- 2.7	24.7	7.29		66.69
248	75		- 2.7	20.3	7.29		- 54.81
249	75		- 2.7	.3	7.29		- .81
250	75		- 2.7	- 9.7	7.29		26.19
251	85		7.3	10.3	53.29		75.19
252	95		17.3	20.3	299.29		351.19
253	75		- 2.7	- 9.7	7.29		26.19
254	85		7.3	20.3	53.29		148.19
255	75		- 2.7	10.3	7.29		- 27.81
256	95		17.3	20.3	299.29		351.19
257	85		7.3	-39.7	53.29		-289.81
258	75		- 2.7	10.3	7.29		- 27.81
259	75		- 2.7	20.3	7.29		- 54.81
260	75		- 2.7	10.3	7.29		- 27.81
261	--		--	---	---		---
262	85		7.3	.3	53.29		2.19
263	75		- 2.7	- 9.7	7.29		26.19
264	85		7.3	20.3	53.29		148.19
265	75		- 2.7	20.3	7.29		- 54.81
266	65		-12.7	- 9.7	161.29		129.19
267	75		- 2.7	.3	7.29		- .81
268	75		- 2.7	- 9.7	7.29		26.19
269	75		- 2.7	.3	7.29		- .81
270	85		7.3	- 9.7	53.29		- 70.81
271	85		7.3	.3	53.29		2.19
272	75		- 2.7	.3	7.29		- .81
273	65		-12.7	10.3	161.29		-130.81
274	75		- 2.7	.3	7.29		- .81
275	85		7.3	- 9.7	53.29		- 70.81
276	75		- 2.7	.3	7.29		- .81
277	85		7.3	.3	53.29		2.19
278	85		7.3	20.3	53.29		148.19
279	75		- 2.7	10.3	7.29		- 27.81
280	65		-12.7	.3	161.29		- 3.81
281	75		- 2.7	.3	7.29		- .81
282	65		-12.7	.3	161.29		- 3.81
283	75		- 2.7	10.3	7.29		- 27.81
284	85		7.3	20.3	53.29		-148.19
285	75		- 2.7	.3	7.29		- .81
286	75		- 2.7	.3	7.29		- .81

TABLE VIII b (1957)

1957	1956	1955	1954	1953	1952	1951
239	239	239	239	239	239	239
240	240	240	240	240	240	240
241	241	241	241	241	241	241
242	242	242	242	242	242	242
243	243	243	243	243	243	243
244	244	244	244	244	244	244
245	245	245	245	245	245	245
246	246	246	246	246	246	246
247	247	247	247	247	247	247
248	248	248	248	248	248	248
249	249	249	249	249	249	249
250	250	250	250	250	250	250
251	251	251	251	251	251	251
252	252	252	252	252	252	252
253	253	253	253	253	253	253
254	254	254	254	254	254	254
255	255	255	255	255	255	255
256	256	256	256	256	256	256
257	257	257	257	257	257	257
258	258	258	258	258	258	258
259	259	259	259	259	259	259
260	260	260	260	260	260	260
261	261	261	261	261	261	261
262	262	262	262	262	262	262
263	263	263	263	263	263	263
264	264	264	264	264	264	264
265	265	265	265	265	265	265
266	266	266	266	266	266	266
267	267	267	267	267	267	267
268	268	268	268	268	268	268
269	269	269	269	269	269	269
270	270	270	270	270	270	270
271	271	271	271	271	271	271
272	272	272	272	272	272	272
273	273	273	273	273	273	273
274	274	274	274	274	274	274
275	275	275	275	275	275	275
276	276	276	276	276	276	276
277	277	277	277	277	277	277
278	278	278	278	278	278	278
279	279	279	279	279	279	279
280	280	280	280	280	280	280
281	281	281	281	281	281	281
282	282	282	282	282	282	282
283	283	283	283	283	283	283
284	284	284	284	284	284	284
285	285	285	285	285	285	285
286	286	286	286	286	286	286

TABLE VIII b (1937)

No.	X	Y	x	y	x ²	y ²	xy
287	85	Same as	7.3	10.3	53.29	Same as	75.19
288	75	III b	- 2.7	.3	7.29	III b	- .81
289	85		7.3	.3	53.29		2.19
290	85		7.3	10.3	53.29		75.19
291	75		- 2.7	10.3	7.29		- 27.81
292	75		- 2.7	20.3	7.29		- 54.81
293	85		7.3	20.3	53.29		148.19
294	75		- 2.7	.3	7.29		- .81
295	75		- 2.7	.3	7.29		- .81
296	75		- 2.7	20.3	7.29		- 54.81
297	85		7.3	- 9.7	53.29		- 70.81
298	65		-12.7	- 9.7	161.29		129.19
299	85		7.3	10.3	53.29		75.19
300	85		7.3	20.3	53.29		148.19
301	75		- 2.7	-24.7	7.29		66.69
302	65		-12.7	10.3	161.29		-130.81
303	75		- 2.7	10.3	7.29		- 27.81
304	85		7.3	.3	53.29		2.19
305	85		7.3	.3	53.29		2.19
306	75		- 2.7	.3	7.29		- .81
307	75		- 2.7	-24.7	7.29		66.69
308	75		- 2.7	.3	7.29		- .81
309	75		- 2.7	- 9.7	7.29		26.19
310	85		7.3	10.3	53.29		75.19
311	65		-12.7	- 9.7	161.29		129.19
312	75		- 2.7	.3	7.29		- .81
313	85		7.3	- 9.7	53.29		- 70.81
314	85		7.3	10.3	53.29		75.19
315	65		-12.7	-24.7	161.29		313.69
316	65		-12.7	.3	161.29		- 3.81
317	75		- 2.7	10.3	7.29		- 27.81
318	65		-12.7	-39.7	161.29		504.19
319	65		-12.7	-24.7	161.29		313.69
320	65		-12.7	- 9.7	161.29		129.19
321	65		-12.7	- 9.7	161.29		129.19
322	65		-12.7	.3	161.29		- 3.81
323	65		-12.7	.3	161.29		- 3.81
324	75		- 2.7	- 9.7	7.29		26.19
325	75		- 2.7	- 9.7	7.29		26.19
326	65		-12.7	-24.7	161.29		313.69
327	65		-12.7	-39.7	161.29		504.19
328	65		-12.7	-39.7	161.29		504.19
329	65		-12.7	-39.7	161.29		504.19
330	65		-12.7	-24.7	161.29		313.69
331	--		---	---	---		---
332	75		- 2.7	- 9.7	7.29		26.19
333	75		- 2.7	-39.7	7.29		107.19
334	75		- 2.7	- 9.7	7.29		26.19

TABLE VIII b (1937)

No.	I	Y	X	V	X ²	V ²	XY
287	85	Same as	7.2	10.2	85.25	104.04	78.12
288	75	ill p	- 2.7	2	7.25	4	- 18.15
289	85		7.2	2	85.25	4	61.12
290	85		7.2	10.2	85.25	104.04	78.12
291	75	-	- 2.7	10.2	7.25	104.04	- 27.81
292	75	-	- 2.7	20.2	7.25	404.04	- 54.81
293	85		7.2	20.2	85.25	404.04	148.12
294	75	-	- 2.7	2	7.25	4	- 18.15
295	75	-	- 2.7	2	7.25	4	- 18.15
296	75	-	- 2.7	20.2	7.25	404.04	- 54.81
297	85		7.2	- 9.7	85.25	94.09	- 70.81
298	85	-12.7	-12.7	- 9.7	161.29	94.09	-129.12
299	85	-	- 7.2	10.2	85.25	104.04	78.12
300	85		7.2	20.2	85.25	404.04	148.12
301	75	-	- 2.7	-24.7	7.25	605.09	- 66.82
302	85	-12.7	-12.7	10.2	161.29	104.04	-150.81
303	75	-	- 2.7	10.2	7.25	104.04	- 27.81
304	85		7.2	2	85.25	4	61.12
305	85		7.2	2	85.25	4	61.12
306	75	-	- 2.7	2	7.25	4	- 18.15
307	75	-	- 2.7	-24.7	7.25	605.09	- 66.82
308	75	-	- 2.7	2	7.25	4	- 18.15
309	75	-	- 2.7	- 9.7	7.25	94.09	- 26.12
310	85		7.2	10.2	85.25	104.04	78.12
311	85	-12.7	-12.7	- 9.7	161.29	94.09	-129.12
312	75	-	- 2.7	2	7.25	4	- 18.15
313	85		7.2	- 9.7	85.25	94.09	- 70.81
314	85		7.2	10.2	85.25	104.04	78.12
315	85	-12.7	-12.7	-24.7	161.29	605.09	-212.82
316	85	-12.7	-12.7	2	161.29	4	- 3.81
317	75	-	- 2.7	10.2	7.25	104.04	- 27.81
318	85	-12.7	-12.7	-29.7	161.29	882.09	-204.12
319	85	-12.7	-12.7	-24.7	161.29	605.09	-212.82
320	85	-12.7	-12.7	- 9.7	161.29	94.09	-129.12
321	85	-12.7	-12.7	- 9.7	161.29	94.09	-129.12
322	85	-12.7	-12.7	2	161.29	4	- 3.81
323	85	-12.7	-12.7	2	161.29	4	- 3.81
324	75	-	- 2.7	- 9.7	7.25	94.09	- 26.12
325	75	-	- 2.7	- 9.7	7.25	94.09	- 26.12
326	85	-12.7	-12.7	-29.7	161.29	882.09	-204.12
327	85	-12.7	-12.7	-24.7	161.29	605.09	-212.82
328	85	-12.7	-12.7	-29.7	161.29	882.09	-204.12
329	85	-12.7	-12.7	-24.7	161.29	605.09	-212.82
330	85	-12.7	-12.7	-24.7	161.29	605.09	-212.82
331	--	--	--	--	--	--	--
332	75	-	- 2.7	- 9.7	7.25	94.09	- 26.12
333	75	-	- 2.7	-29.7	7.25	882.09	-107.12
334	75	-	- 2.7	- 9.7	7.25	94.09	- 26.12

TABLE VIII b (1937)

No.	X	Y	x	y	x ²	y ²	xy
335	65	Same as	-12.7	-24.7	161.29	Same as	313.69
336	75	III b	- 2.7	-24.7	7.29	III b	66.69
337	75		- 2.7	-39.7	7.29		107.19
338	75		- 2.7	- 9.7	7.29		26.19
339	65		-12.7	-39.7	161.29		504.19
340	85		7.3	-24.7	53.29		-180.31
341	85		7.3	- 9.7	53.29		- 70.81
342	65		-12.7	-24.7	161.29		313.69
336	26100	25095			21,499.44	69,936.33	15679.34
	77.7	74.7					

Correlating:

$$r = \frac{\sum xy}{\sqrt{\sum x^2} \times \sqrt{\sum y^2}} = \frac{15,679.34}{\sqrt{21,499.44} \times \sqrt{69,936.33}}$$

$$r = \frac{15,679.34}{146.63 \times 264.46} = \frac{15,679.34}{38,777.77} = .404$$

$$\begin{aligned} \text{P.E.}_r &= \frac{.6745 \times (1-r^2)}{\sqrt{N}} = \frac{.6745 \times (1-.1632)}{\sqrt{336}} \\ &= \frac{.5644}{18.33} = .0307 \end{aligned}$$

TABLE VIII b (1937)

No.	X	Y	x	y	X ²	Y ²	XY
338	35	30	-12.7	-24.7	161.29	620.09	-313.69
339	35	30	-12.7	-24.7	161.29	620.09	-313.69
340	35	30	-12.7	-24.7	161.29	620.09	-313.69
341	35	30	-12.7	-24.7	161.29	620.09	-313.69
342	35	30	-12.7	-24.7	161.29	620.09	-313.69
343	35	30	-12.7	-24.7	161.29	620.09	-313.69
344	35	30	-12.7	-24.7	161.29	620.09	-313.69
345	35	30	-12.7	-24.7	161.29	620.09	-313.69
346	35	30	-12.7	-24.7	161.29	620.09	-313.69
347	35	30	-12.7	-24.7	161.29	620.09	-313.69
348	35	30	-12.7	-24.7	161.29	620.09	-313.69
349	35	30	-12.7	-24.7	161.29	620.09	-313.69
350	35	30	-12.7	-24.7	161.29	620.09	-313.69
351	35	30	-12.7	-24.7	161.29	620.09	-313.69
352	35	30	-12.7	-24.7	161.29	620.09	-313.69
353	35	30	-12.7	-24.7	161.29	620.09	-313.69
354	35	30	-12.7	-24.7	161.29	620.09	-313.69
355	35	30	-12.7	-24.7	161.29	620.09	-313.69
356	35	30	-12.7	-24.7	161.29	620.09	-313.69
357	35	30	-12.7	-24.7	161.29	620.09	-313.69
358	35	30	-12.7	-24.7	161.29	620.09	-313.69
359	35	30	-12.7	-24.7	161.29	620.09	-313.69
360	35	30	-12.7	-24.7	161.29	620.09	-313.69
361	35	30	-12.7	-24.7	161.29	620.09	-313.69
362	35	30	-12.7	-24.7	161.29	620.09	-313.69
363	35	30	-12.7	-24.7	161.29	620.09	-313.69
364	35	30	-12.7	-24.7	161.29	620.09	-313.69
365	35	30	-12.7	-24.7	161.29	620.09	-313.69
366	35	30	-12.7	-24.7	161.29	620.09	-313.69
367	35	30	-12.7	-24.7	161.29	620.09	-313.69
368	35	30	-12.7	-24.7	161.29	620.09	-313.69
369	35	30	-12.7	-24.7	161.29	620.09	-313.69
370	35	30	-12.7	-24.7	161.29	620.09	-313.69
371	35	30	-12.7	-24.7	161.29	620.09	-313.69
372	35	30	-12.7	-24.7	161.29	620.09	-313.69
373	35	30	-12.7	-24.7	161.29	620.09	-313.69
374	35	30	-12.7	-24.7	161.29	620.09	-313.69
375	35	30	-12.7	-24.7	161.29	620.09	-313.69
376	35	30	-12.7	-24.7	161.29	620.09	-313.69
377	35	30	-12.7	-24.7	161.29	620.09	-313.69
378	35	30	-12.7	-24.7	161.29	620.09	-313.69
379	35	30	-12.7	-24.7	161.29	620.09	-313.69
380	35	30	-12.7	-24.7	161.29	620.09	-313.69
381	35	30	-12.7	-24.7	161.29	620.09	-313.69
382	35	30	-12.7	-24.7	161.29	620.09	-313.69
383	35	30	-12.7	-24.7	161.29	620.09	-313.69
384	35	30	-12.7	-24.7	161.29	620.09	-313.69
385	35	30	-12.7	-24.7	161.29	620.09	-313.69
386	35	30	-12.7	-24.7	161.29	620.09	-313.69
387	35	30	-12.7	-24.7	161.29	620.09	-313.69
388	35	30	-12.7	-24.7	161.29	620.09	-313.69
389	35	30	-12.7	-24.7	161.29	620.09	-313.69
390	35	30	-12.7	-24.7	161.29	620.09	-313.69
391	35	30	-12.7	-24.7	161.29	620.09	-313.69
392	35	30	-12.7	-24.7	161.29	620.09	-313.69
393	35	30	-12.7	-24.7	161.29	620.09	-313.69
394	35	30	-12.7	-24.7	161.29	620.09	-313.69
395	35	30	-12.7	-24.7	161.29	620.09	-313.69
396	35	30	-12.7	-24.7	161.29	620.09	-313.69
397	35	30	-12.7	-24.7	161.29	620.09	-313.69
398	35	30	-12.7	-24.7	161.29	620.09	-313.69
399	35	30	-12.7	-24.7	161.29	620.09	-313.69
400	35	30	-12.7	-24.7	161.29	620.09	-313.69

Correlation:

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}} = \frac{16,673.34}{\sqrt{161,493.44 \times 68,936.36}} = .404$$

$$P.E. r = \frac{.0745 \times (1 - r^2)}{\sqrt{35}} = \frac{.0745 \times (1 - .1632)}{\sqrt{35}} = .0133$$

TABLE VIII c (1936)

Correlation of High School Average and Algebra Final Grade

No.	X	Y	x	y	x ²	y ²	xy
1	85	95	6.34	17.7	39.69	313.29	111.51
2	85	95	6.34	17.7	39.69	313.29	111.51
3	75	75	- 3.66	- 2.3	13.69	5.29	8.51
4	85	65	6.34	-12.3	39.69	151.29	- 77.49
5	75	85	- 3.66	7.7	13.69	59.29	- 28.49
6	85	85	6.34	7.7	39.69	59.29	48.51
7	65	75	-13.66	- 2.3	187.69	5.29	31.51
8	85	85	6.34	7.7	39.69	59.29	48.51
9	85	50	6.34	-27.3	39.69	745.29	-171.99
10	75	85	- 3.66	7.7	13.69	59.29	- 28.49
11	85	85	6.34	7.7	39.69	59.29	48.51
12	75	85	- 3.66	7.7	13.69	59.29	- 28.49
13	85	85	6.34	7.7	39.69	59.29	48.51
14	85	75	6.34	- 2.3	39.69	5.29	- 14.49
15	75	85	- 3.66	7.7	13.69	59.29	- 28.49
16	85	65	6.34	12.3	39.69	151.29	- 77.49
17	85	85	6.34	7.7	39.69	59.29	48.51
18	85	85	6.34	7.7	39.69	59.29	48.51
19	85	95	6.34	17.7	39.69	313.29	111.51
20	75	65	- 3.66	-12.3	13.69	151.29	45.51
21	75	85	- 3.66	7.7	13.69	59.29	- 28.49
22	85	85	6.34	7.7	39.69	59.29	58.51
23	75	95	- 3.66	- 2.3	13.69	5.29	8.51
24	75	75	- 3.66	17.7	13.69	313.29	- 65.49
25	65	85	-13.66	7.7	187.69	59.29	-105.49
26	85	95	6.34	7.7	39.69	313.29	111.51
27	75	85	- 3.66	7.7	13.69	59.29	- 28.49
28	75	75	- 3.66	- 2.3	13.69	5.29	8.51
29	65	85	-13.66	7.7	187.69	59.29	-105.49
30	85	50	6.34	-27.3	39.69	745.29	-171.99
31	95	95	16.34	17.7	265.69	313.29	288.51
32	75	65	- 3.66	-12.3	13.69	151.29	45.51
33	85	75	6.34	- 2.3	39.69	5.29	- 14.49
34	85	75	6.34	- 2.3	39.69	5.29	- 14.49
35	85	65	6.34	-12.3	39.69	151.29	- 77.49
36	75	85	- 3.7	7.7	13.69	59.29	- 28.49
37	75	75	- 3.7	- 2.3	13.69	5.29	8.51
38	85	65	6.3	-12.3	39.69	51.29	- 77.49
39	65	55	-13.7	-27.3	187.69	745.29	374.01
40	75	75	- 3.7	- 2.3	13.69	5.29	8.51
41	65	75	-13.7	-12.3	187.69	151.29	168.51
42	75	65	- 3.7	7.7	13.69	59.29	- 28.49
43	75	85	- 3.7	7.7	13.69	59.29	- 28.49
44	75	85	- 3.7	7.7	13.69	59.29	- 28.49
45	85	85	6.3	- 2.3	39.69	5.29	- 14.49
46	75	85	- 3.7	7.7	13.69	59.29	- 28.49

TABLE VIII c (1936)

Correlation of High School Average and Algebra Final Grade

No.	X	Y	X	Y	X	Y	X	Y
1	85	95	6.84	17.7	39.69	313.29	111.51	111.51
2	85	95	6.84	17.7	39.69	313.29	111.51	111.51
3	75	75	- 3.66	- 3.2	13.69	8.29	8.51	8.51
4	85	65	6.84	-12.3	39.69	151.29	- 77.49	- 77.49
5	75	85	- 3.66	7.7	13.69	59.29	- 38.49	- 38.49
6	85	65	6.84	7.7	39.69	59.29	48.51	48.51
7	65	75	-12.66	- 2.3	187.69	8.29	51.51	51.51
8	85	85	6.84	7.7	39.69	59.29	48.51	48.51
9	85	85	6.84	-27.3	39.69	745.29	-171.99	-171.99
10	75	85	- 3.66	7.7	13.69	59.29	- 38.49	- 38.49
11	85	65	6.84	7.7	39.69	59.29	48.51	48.51
12	75	85	- 3.66	7.7	13.69	59.29	- 38.49	- 38.49
13	85	65	6.84	7.7	39.69	59.29	48.51	48.51
14	85	75	6.84	- 2.3	39.69	8.29	- 14.49	- 14.49
15	75	85	- 3.66	7.7	13.69	59.29	- 38.49	- 38.49
16	85	65	6.84	12.3	39.69	151.29	- 77.49	- 77.49
17	85	65	6.84	7.7	39.69	59.29	48.51	48.51
18	85	65	6.84	7.7	39.69	59.29	48.51	48.51
19	85	95	6.84	17.7	39.69	313.29	111.51	111.51
20	75	65	- 3.66	-12.3	13.69	151.29	45.51	45.51
21	75	85	- 3.66	7.7	13.69	59.29	- 38.49	- 38.49
22	85	65	6.84	7.7	39.69	59.29	48.51	48.51
23	75	95	- 3.66	- 2.3	13.69	8.29	8.51	8.51
24	75	85	- 3.66	17.7	13.69	313.29	- 38.49	- 38.49
25	65	65	-12.66	7.7	187.69	59.29	-105.49	-105.49
26	85	65	6.84	7.7	39.69	313.29	111.51	111.51
27	75	85	- 3.66	7.7	13.69	59.29	- 38.49	- 38.49
28	75	75	- 3.66	- 2.3	13.69	8.29	8.51	8.51
29	65	65	-23.66	7.7	187.69	59.29	-105.49	-105.49
30	85	85	6.84	-27.3	39.69	745.29	-171.99	-171.99
31	95	95	16.84	17.7	286.69	313.29	388.51	388.51
32	75	65	- 3.66	-12.3	13.69	151.29	45.51	45.51
33	85	75	6.84	- 2.3	39.69	8.29	- 14.49	- 14.49
34	85	75	6.84	- 2.3	39.69	8.29	- 14.49	- 14.49
35	85	65	6.84	-12.3	39.69	151.29	- 77.49	- 77.49
36	75	85	- 3.66	7.7	13.69	59.29	- 38.49	- 38.49
37	75	75	- 3.66	- 2.3	13.69	8.29	8.51	8.51
38	85	85	6.84	-12.3	39.69	313.29	- 77.49	- 77.49
39	65	65	-12.7	-27.3	187.69	745.29	374.01	374.01
40	75	75	- 3.66	- 2.3	13.69	8.29	8.51	8.51
41	75	65	-12.7	-12.3	187.69	151.29	168.51	168.51
42	75	65	- 3.66	7.7	13.69	59.29	- 38.49	- 38.49
43	75	85	- 3.66	7.7	13.69	59.29	- 38.49	- 38.49
44	75	85	- 3.66	7.7	13.69	59.29	- 38.49	- 38.49
45	85	85	6.84	- 2.3	39.69	8.29	- 14.49	- 14.49
46	75	85	- 3.66	7.7	13.69	59.29	- 38.49	- 38.49

TABLE VIII c (1936)

No.	X	Y	x	y	x ²	y ²	xy
47	95	75	16.3	17.7	265.69	313.29	288.51
48	75	75	- 3.7	- 2.3	13.69	5.29	8.51
49	75	75	- 3.7	- 2.3	13.69	5.29	8.51
50	85	85	6.3	7.7	39.69	59.29	48.51
51	75	75	- 3.7	- 2.3	13.69	5.29	- 8.51
52	85	85	6.3	7.7	39.69	59.29	48.51
53	85	85	6.3	7.7	39.69	59.29	48.51
54	75	75	- 3.7	- 2.3	13.69	5.29	8.51
55	75	85	- 3.7	7.7	13.69	59.29	- 28.49
56	65	65	-13.7	-12.3	187.69	151.29	168.51
57	75	75	- 3.7	- 2.3	13.69	5.29	8.51
58	75	75	- 3.7	- 2.3	13.69	5.29	8.51
59	75	65	- 3.7	-12.3	13.69	151.29	45.51
60	75	85	- 3.7	7.7	13.69	59.29	- 28.49
61	75	65	- 3.7	-12.3	13.69	151.29	45.51
62	85	85	6.3	7.7	39.69	59.29	48.51
63	85	85	6.3	7.7	39.69	59.29	48.51
64	85	85	6.3	7.7	39.69	59.29	48.51
65	75	35	- 3.7	-42.3	13.69	1789.29	156.51
66	75	35	- 3.7	7.7	13.69	59.29	- 28.49
67	75	85	- 3.7	7.7	13.69	59.29	- 28.49
68	85	85	6.3	7.7	39.69	59.29	48.51
69	85	85	6.3	-12.3	39.69	151.29	- 77.49
70	75	65	- 3.7	- 2.3	13.69	5.29	8.51
71	75	85	- 3.7	7.7	13.69	59.29	- 28.49
72	85	85	6.3	7.7	39.69	59.29	48.51
73	75	85	- 3.7	7.7	13.69	59.29	- 28.49
74	75	95	- 3.7	17.7	13.69	313.29	- 65.49
75	85	85	6.3	7.7	39.69	59.29	48.51
76	75	75	- 3.7	- 2.3	13.69	5.29	8.51
77	85	75	6.3	- 2.3	39.69	5.29	- 14.49
78	95	95	16.3	17.7	265.69	313.29	288.51
79	65	75	-13.7	- 2.3	187.69	5.29	31.51
80	65	65	-13.7	-12.3	187.69	151.29	168.51
81	95	75	16.3	- 2.3	265.69	5.29	- 37.49
82	75	75	- 3.7	- 2.3	13.69	5.29	8.51
83	65	85	-13.7	7.7	187.69	59.29	-105.49
84	75	85	- 3.7	7.7	13.69	59.29	- 28.49
85	75	75	- 3.7	- 2.3	13.69	5.29	8.51
86	75	75	- 3.7	- 2.3	13.69	5.29	8.51
87	95	85	16.3	7.7	265.69	59.29	125.51
88	85	75	6.3	- 2.3	39.69	5.29	- 14.49
89	65	65	-13.7	-12.3	187.69	151.29	168.51
90	95	85	16.3	7.7	265.69	59.29	125.51
91	85	65	6.3	-12.3	39.69	151.29	- 77.49
92	75	55	- 3.7	-27.3	13.69	745.29	101.01
93	85	85	6.3	7.7	39.69	59.29	48.51
94	85	85	6.3	7.7	39.69	59.29	48.51

TABLE VIII (1955)

NO.	1	Y	X	Y	X	Y	X
47	85	75	10.2	17.7	85.0	213.2	258.0
48	75	75	- 2.7	- 2.5	13.0	8.2	13.0
49	75	75	- 2.7	- 2.5	13.0	8.2	13.0
50	85	85	0.2	7.7	22.0	22.0	22.0
51	75	75	- 2.7	- 2.5	13.0	8.2	13.0
52	85	85	0.2	7.7	22.0	22.0	22.0
53	85	85	0.2	7.7	22.0	22.0	22.0
54	75	75	- 2.7	- 2.5	13.0	8.2	13.0
55	75	75	- 2.7	- 2.5	13.0	8.2	13.0
56	85	85	-12.7	-12.3	187.0	187.0	187.0
57	75	75	- 2.7	- 2.5	13.0	8.2	13.0
58	75	75	- 2.7	- 2.5	13.0	8.2	13.0
59	75	75	- 2.7	-12.3	187.0	187.0	187.0
60	75	75	- 2.7	7.7	22.0	22.0	22.0
61	85	85	- 2.7	-12.3	187.0	187.0	187.0
62	85	85	0.2	7.7	22.0	22.0	22.0
63	85	85	0.2	7.7	22.0	22.0	22.0
64	85	85	0.2	7.7	22.0	22.0	22.0
65	75	75	- 2.7	-42.3	128.0	128.0	128.0
66	75	75	- 2.7	7.7	22.0	22.0	22.0
67	75	85	- 2.7	7.7	22.0	22.0	22.0
68	85	85	0.2	7.7	22.0	22.0	22.0
69	85	85	0.2	-12.3	187.0	187.0	187.0
70	75	75	- 2.7	- 2.5	13.0	8.2	13.0
71	75	85	- 2.7	7.7	22.0	22.0	22.0
72	85	85	0.2	7.7	22.0	22.0	22.0
73	75	85	- 2.7	7.7	22.0	22.0	22.0
74	75	85	- 2.7	17.7	13.0	213.2	258.0
75	85	85	0.2	7.7	22.0	22.0	22.0
76	75	75	- 2.7	- 2.5	13.0	8.2	13.0
77	85	85	0.2	- 2.5	13.0	8.2	13.0
78	85	85	10.2	17.7	258.0	213.2	258.0
79	85	75	-12.7	- 2.5	187.0	8.2	13.0
80	85	85	-12.7	0.2	187.0	213.2	258.0
81	95	75	10.2	- 2.5	258.0	8.2	13.0
82	75	75	- 2.7	0.2	13.0	8.2	13.0
83	85	85	-12.7	7.7	187.0	22.0	22.0
84	75	75	- 2.7	7.7	13.0	22.0	22.0
85	75	75	- 2.7	- 2.5	13.0	8.2	13.0
86	75	75	- 2.7	- 2.5	13.0	8.2	13.0
87	95	85	10.2	7.7	258.0	22.0	22.0
88	85	75	0.2	- 2.5	22.0	8.2	13.0
89	85	85	-12.7	-12.3	187.0	187.0	187.0
90	95	85	10.2	7.7	258.0	22.0	22.0
91	85	85	0.2	-12.3	22.0	187.0	187.0
92	75	85	- 2.7	-27.3	13.0	258.0	258.0
93	85	85	0.2	7.7	22.0	22.0	22.0
94	85	85	0.2	7.7	22.0	22.0	22.0

TABLE VIII c (1936)

No.	X	Y	x	y	x ²	y ²	xy
95	95	95	16.3	17.7	265.69	313.29	288.51
96	75	65	- 3.7	-12.3	13.69	151.29	45.51
97	75	85	- 3.7	7.7	13.69	59.29	- 28.49
98	75	85	- 3.7	7.7	13.69	59.29	- 28.49
99	85	85	6.3	7.7	39.69	59.29	48.51
100	65	65	-13.7	-12.3	187.69	151.29	168.51
101	85	65	6.3	-12.3	39.69	151.29	- 77.49
102	75	65	- 3.7	-12.3	13.69	151.29	45.51
103	75	85	- 3.7	7.7	13.69	59.29	- 28.49
104	75	65	- 3.7	-12.3	13.69	151.29	45.51
105	85	65	6.3	-12.3	39.69	151.29	- 77.49
106	65	85	-13.7	7.7	187.69	59.29	105.49
107	75	85	- 3.7	7.7	13.69	59.29	- 28.49
108	65	75	-13.7	- 2.3	187.69	5.29	31.51
109	85	85	6.3	7.7	39.69	59.29	48.51
110	75	75	- 3.7	- 2.3	13.69	5.29	8.51
111	75	75	- 3.7	- 2.3	13.69	5.29	8.51
112	75	75	- 3.7	- 2.3	13.69	5.29	8.51
113	75	85	- 3.7	7.7	13.69	59.29	- 28.49
114	65	95	-13.7	17.7	187.69	313.29	-242.49
115	95	75	16.3	- 2.3	265.69	5.29	- 37.49
116	75	85	- 3.7	7.7	13.69	59.29	- 28.49
117	65	65	- 3.7	-12.3	13.69	151.29	45.51
118	85	65	6.3	-12.3	39.69	151.29	- 77.49
119	75	65	- 3.7	-12.3	13.69	151.29	45.51
120	75	75	- 3.7	- 2.3	13.69	5.29	8.51
121	85	95	6.3	17.7	39.69	313.29	111.51
122	75	75	- 3.7	- 2.3	13.69	5.29	8.51
123	75	75	- 3.7	- 2.3	13.69	5.29	8.51
124	85	65	6.3	-12.3	39.69	151.29	- 77.49
125	85	75	6.3	- 2.3	39.69	5.29	- 14.49
126	95	85	16.3	7.7	265.69	59.29	125.51
127	85	75	6.3	- 2.3	39.69	5.29	- 14.49
128	75	75	- 3.7	- 2.3	13.69	5.29	8.51
129	75	65	- 3.7	-12.3	13.69	151.29	45.51
130	85	85	6.3	7.7	39.69	59.29	48.51
131	75	85	- 3.7	7.7	13.69	59.29	- 28.49
132	--	--	--	--	---	---	---
133	75	75	- 3.7	- 2.3	13.69	5.29	8.51
134	--	--	--	--	---	---	---
135	85	75	6.3	- 2.3	39.69	5.29	- 14.49
136	85	65	6.3	-12.3	39.69	151.29	-77.49
137	85	85	6.3	7.7	39.69	59.29	48.51
138	75	65	- 3.7	-12.3	13.69	151.29	45.51
139	85	85	6.3	7.7	39.69	59.29	48.51
140	75	95	- 3.7	17.7	13.69	313.29	- 65.49
141	85	95	6.3	17.7	39.69	313.29	111.51
142	75	65	- 3.7	-12.3	13.69	151.29	45.51

TABLE VIII
(1930)

No.	X	Y	X	Y	X	Y
95	95	95	17.7	18.3	205.63	213.33
96	95	95	-18.3	-3.7	181.33	181.33
97	95	95	7.7	-3.7	99.33	99.33
98	95	95	7.7	-3.7	99.33	99.33
99	95	95	7.7	8.3	99.33	99.33
100	95	95	-18.3	-18.3	181.33	181.33
101	95	95	8.3	-18.3	181.33	181.33
102	95	95	-18.3	-3.7	181.33	181.33
103	95	95	7.7	-3.7	99.33	99.33
104	95	95	-18.3	-3.7	181.33	181.33
105	95	95	8.3	8.3	99.33	99.33
106	95	95	-18.3	-18.3	181.33	181.33
107	95	95	7.7	-3.7	99.33	99.33
108	95	95	-18.3	-18.3	181.33	181.33
109	95	95	7.7	8.3	99.33	99.33
110	95	95	-18.3	-3.7	181.33	181.33
111	95	95	8.3	-3.7	99.33	99.33
112	95	95	-18.3	-3.7	181.33	181.33
113	95	95	7.7	-3.7	99.33	99.33
114	95	95	-18.3	-18.3	181.33	181.33
115	95	95	8.3	-3.7	99.33	99.33
116	95	95	-18.3	-3.7	181.33	181.33
117	95	95	7.7	-3.7	99.33	99.33
118	95	95	-18.3	-18.3	181.33	181.33
119	95	95	8.3	-3.7	99.33	99.33
120	95	95	-18.3	-3.7	181.33	181.33
121	95	95	7.7	8.3	99.33	99.33
122	95	95	-18.3	-3.7	181.33	181.33
123	95	95	8.3	-3.7	99.33	99.33
124	95	95	-18.3	-18.3	181.33	181.33
125	95	95	7.7	-3.7	99.33	99.33
126	95	95	-18.3	-3.7	181.33	181.33
127	95	95	8.3	-3.7	99.33	99.33
128	95	95	-18.3	-3.7	181.33	181.33
129	95	95	7.7	8.3	99.33	99.33
130	95	95	-18.3	-3.7	181.33	181.33
131	95	95	8.3	-3.7	99.33	99.33
132	95	95	-18.3	-3.7	181.33	181.33
133	95	95	7.7	8.3	99.33	99.33
134	95	95	-18.3	-3.7	181.33	181.33
135	95	95	8.3	-3.7	99.33	99.33
136	95	95	-18.3	-3.7	181.33	181.33
137	95	95	7.7	8.3	99.33	99.33
138	95	95	-18.3	-3.7	181.33	181.33
139	95	95	8.3	-3.7	99.33	99.33
140	95	95	-18.3	-3.7	181.33	181.33
141	95	95	7.7	8.3	99.33	99.33
142	95	95	-18.3	-3.7	181.33	181.33

TABLE VIII c (1936)

No.	X	Y	x	y	x ²	y ²	xy
143	75	95	- 3.7	17.7	13.69	313.29	- 65.49
144	75	75	- 3.7	- 2.3	13.69	5.29	8.51
145	75	95	- 3.7	17.7	13.69	313.29	- 65.49
146	65	75	-13.7	- 2.3	187.69	5.29	31.51
147	65	75	-13.7	- 2.3	187.69	5.29	31.51
148	85	75	6.3	- 2.3	39.69	5.29	- 14.49
149	85	85	6.3	7.7	39.69	59.29	48.51
150	75	65	- 3.7	-12.3	13.69	151.29	45.51
151	85	85	6.3	7.7	39.69	59.29	48.51
152	95	95	16.3	17.7	265.69	313.29	288.51
153	75	85	- 3.7	7.7	13.69	59.29	- 28.49
154	95	65	16.3	-12.3	265.69	151.29	-200.49
155	75	75	- 3.7	- 2.3	13.69	5.29	8.51
156	85	65	6.3	-12.3	39.69	151.29	- 77.49
157	85	85	6.3	7.7	39.69	59.29	48.51
158	75	65	- 3.7	-12.3	13.69	151.29	45.51
159	75	75	- 3.7	- 2.3	13.69	5.29	8.51
160	85	85	6.3	7.7	39.69	59.29	48.51
161	65	55	-13.7	-27.3	187.69	745.29	374.01
162	65	75	-13.7	- 2.3	187.69	5.29	31.51
163	65	75	-13.7	- 2.3	187.69	5.29	31.51
164	85	65	6.3	-12.3	39.69	151.29	- 77.49
165	75	85	- 3.7	7.7	13.69	59.29	- 28.49
166	75	85	- 3.7	7.7	13.69	59.29	- 28.49
167	75	75	- 3.7	- 2.3	13.69	5.29	8.51
168	95	95	16.3	17.7	265.69	313.29	288.51
169	75	95	- 3.7	17.7	13.69	313.29	- 65.49
170	85	75	6.3	- 2.3	39.69	5.29	- 14.49
171	85	65	6.3	-12.3	39.69	151.29	- 77.49
172	75	85	-3.7	7.7	13.69	59.29	- 28.49
173	75	75	- 3.7	- 2.3	13.69	5.29	8.51
174	75	95	- 3.7	17.7	13.69	313.29	- 65.49
175	85	95	6.3	17.7	39.69	313.29	111.51
176	75	75	- 3.7	- 2.3	13.69	5.29	8.51
177	75	75	- 3.7	- 2.3	13.69	5.29	8.51
178	95	95	16.3	17.7	265.69	313.29	288.51
179	75	65	- 3.7	-12.3	13.69	151.29	45.51
180	85	85	6.3	7.7	39.69	59.29	48.51
181	85	75	6.3	- 2.3	39.69	5.29	- 14.49
182	85	85	6.3	7.7	39.69	59.29	48.51
183	75	75	-3.7	- 2.3	13.69	5.29	8.51
184	75	75	- 3.7	- 2.3	13.69	5.29	8.51
185	85	85	6.3	7.7	39.69	59.29	48.51
186	75	85	- 3.7	7.7	13.69	59.29	- 28.49
187	75	85	- 3.7	7.7	13.69	59.29	- 28.49
188	75	75	- 3.7	- 2.3	13.69	5.29	8.51
189	75	75	- 3.7	- 2.3	13.69	5.29	8.51
190	85	75	6.3	- 2.3	39.69	5.29	- 14.49

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TABLE VIII (1935)

No.	X	Y	Z	V	S	V	X
143	75	95	- 3.7	17.7	13.69	315.29	- 65.49
144	75	75	- 3.7	3.3	13.69	5.29	8.51
145	75	95	- 3.7	17.7	13.69	315.29	- 65.49
146	65	75	- 13.7	3.3	187.69	5.29	31.51
147	65	75	- 13.7	3.3	187.69	5.29	31.51
148	85	75	- 3.3	3.3	32.69	5.29	- 14.49
149	85	85	6.3	7.7	32.69	32.69	48.51
150	75	65	- 3.7	- 13.3	13.69	151.29	48.51
151	85	65	6.3	7.7	32.69	32.69	48.51
152	95	95	13.3	17.7	265.69	315.29	388.51
153	75	95	- 3.7	7.7	13.69	32.69	- 38.49
154	95	95	13.3	- 13.3	265.69	151.29	- 300.49
155	75	75	- 3.7	3.3	13.69	5.29	8.51
156	65	65	- 6.3	- 13.3	32.69	151.29	- 77.49
157	85	85	6.3	7.7	32.69	32.69	48.51
158	75	65	- 3.7	- 13.3	13.69	151.29	48.51
159	75	75	- 3.7	3.3	13.69	5.29	8.51
160	85	85	6.3	7.7	32.69	32.69	48.51
161	65	65	- 13.7	- 27.3	187.69	745.29	374.51
162	65	75	- 13.7	3.3	187.69	5.29	31.51
163	65	65	- 13.7	3.3	187.69	5.29	31.51
164	65	65	6.3	- 13.3	32.69	151.29	- 77.49
165	75	75	- 3.7	7.7	13.69	32.69	- 38.49
166	75	85	- 3.7	7.7	13.69	32.69	- 38.49
167	75	75	- 3.7	3.3	13.69	5.29	8.51
168	95	95	13.3	17.7	265.69	315.29	388.51
169	75	95	- 3.7	7.7	13.69	32.69	- 38.49
170	65	65	6.3	- 13.3	32.69	151.29	- 77.49
171	65	65	6.3	- 13.3	32.69	151.29	- 77.49
172	75	65	- 3.7	7.7	13.69	32.69	- 38.49
173	75	75	- 3.7	3.3	13.69	5.29	8.51
174	75	95	- 3.7	7.7	13.69	32.69	- 38.49
175	85	85	6.3	7.7	32.69	32.69	48.51
176	75	75	- 3.7	3.3	13.69	5.29	8.51
177	75	75	- 3.7	3.3	13.69	5.29	8.51
178	95	95	13.3	17.7	265.69	315.29	388.51
179	75	65	- 3.7	- 13.3	13.69	151.29	48.51
180	85	85	6.3	7.7	32.69	32.69	48.51
181	65	65	- 6.3	- 13.3	32.69	151.29	- 77.49
182	85	85	6.3	7.7	32.69	32.69	48.51
183	75	75	- 3.7	3.3	13.69	5.29	8.51
184	75	75	- 3.7	3.3	13.69	5.29	8.51
185	85	85	6.3	7.7	32.69	32.69	48.51
186	75	65	- 3.7	7.7	13.69	32.69	- 38.49
187	75	65	- 3.7	7.7	13.69	32.69	- 38.49
188	75	75	- 3.7	3.3	13.69	5.29	8.51
189	75	75	- 3.7	3.3	13.69	5.29	8.51
190	65	75	6.3	3.3	32.69	5.29	- 14.49

TABLE VIII c (1936)

No.	X	Y	x	y	x ²	y ²	xy
191	95	85	16.3	7.7	265.69	59.29	125.51
192	95	85	16.3	7.7	265.69	59.29	125.51
193	85	85	6.3	7.7	39.69	59.29	48.51
194	65	75	-13.7	-2.3	187.69	5.29	31.51
195	75	65	-3.7	-12.3	13.69	151.29	45.51
196	75	65	-3.7	-12.3	13.69	151.29	45.51
197	95	95	16.3	17.7	265.69	313.29	288.51
198	75	95	-3.7	17.7	13.69	313.29	-65.49
199	75	85	-3.7	7.7	13.69	59.29	-28.49
200	75	55	-3.7	-27.3	13.69	745.29	101.01
201	65	75	-13.7	-2.3	187.69	5.29	31.51
202	85	75	6.3	-2.3	39.69	5.29	-14.49
203	75	85	-3.7	7.7	13.69	59.29	-28.49
204	75	85	-3.7	7.7	13.69	59.29	-28.49
205	75	85	-3.7	7.7	13.69	59.29	-28.49
206	75	85	-3.7	7.7	13.69	59.29	-28.49
207	75	85	-3.7	7.7	13.69	59.29	-28.49
208	75	95	-3.7	17.7	13.69	313.29	-65.49
209	85	75	6.3	-2.3	39.69	5.29	-14.49
210	75	95	-3.7	17.7	13.69	313.29	-65.49
211	75	75	-3.7	-2.3	13.69	5.29	8.51
212	85	75	6.3	-2.3	39.69	5.29	-14.49
213	75	95	-3.7	17.7	13.69	313.29	-65.49
214	85	75	6.3	-2.3	39.69	5.29	-14.49
215	85	75	6.3	-2.3	39.69	5.29	-14.49
216	85	85	6.3	7.7	39.69	59.29	48.51
217	85	75	6.3	-2.3	39.69	5.29	-14.49
218	95	85	16.3	7.7	265.69	59.29	125.51
219	75	65	-3.7	-12.3	13.69	151.29	45.51
220	95	85	16.3	7.7	265.69	59.29	125.51
221	75	75	-3.7	-2.3	13.69	5.29	8.51
222	75	65	-3.7	-12.3	13.69	151.29	45.51
223	85	95	6.3	17.7	39.69	313.29	111.51
224	85	75	6.3	-2.3	39.69	5.29	-14.49
225	75	65	-3.7	-12.3	13.69	151.29	45.51
226	85	85	6.3	7.7	39.69	59.29	48.51
227	65	65	-13.7	-12.3	187.69	151.29	168.51
228	85	85	6.3	7.7	39.69	59.29	48.51
229	65	75	-13.7	-2.3	187.69	5.29	31.51
230	75	75	-3.7	-2.3	13.69	5.29	8.51
231	85	85	6.3	7.7	39.69	59.29	48.51
232	75	85	-3.7	7.7	13.69	59.29	-28.49
233	95	85	16.3	7.7	265.69	59.29	125.51
234	75	85	-3.7	7.7	13.69	59.29	-28.49
235	75	75	-3.7	-2.3	13.69	5.29	8.51
236	65	85	-13.7	7.7	187.69	59.29	-105.49
237	65	85	-13.7	7.7	187.69	59.29	-105.49
238	95	85	16.3	7.7	265.69	59.29	125.51

TABLE VIII c (1936)

No.	X	Y	x	y	x ²	y ²	xy
239	85	85	6.3	7.7	39.69	59.29	48.51
240	85	75	6.3	- 2.3	39.69	5.29	- 14.49
241	85	85	6.3	7.7	39.69	59.29	48.51
242	75	65	- 3.7	-12.3	13.69	151.29	45.51
243	95	95	16.3	17.7	265.69	313.29	288.51
244	75	95	- 3.7	17.7	13.69	313.29	- 65.49
245	95	95	16.3	17.7	265.69	313.29	288.51
246	85	75	6.3	- 2.3	39.69	5.29	- 14.49
247	65	85	-13.7	7.7	187.69	59.29	-105.49
248	85	85	6.3	7.7	39.69	59.29	48.51
249	75	85	- 3.7	7.7	13.69	59.29	- 28.49
250	85	75	- 6.3	- 2.3	39.69	5.29	- 14.49
251	85	85	6.3	7.7	39.69	59.29	48.51
252	85	75	6.3	- 2.3	39.69	5.29	- 14.49
253	85	95	6.3	17.7	39.69	313.29	111.51
254	75	85	- 3.7	7.7	13.69	59.29	- 28.49
255	95	85	16.3	7.7	265.69	59.29	125.51
256	75	75	- 3.7	- 2.3	13.69	5.29	8.51
257	75	85	- 3.7	7.7	13.69	59.29	- 28.49
258	65	35	-13.7	-42.3	13.69	1789.29	579.51
259	85	75	6.3	- 2.3	39.69	5.29	- 14.49
260	85	75	6.3	- 2.3	39.69	5.29	- 14.49
261	75	75	- 3.7	- 2.3	13.69	5.29	8.51
262	65	55	-13.7	-27.3	187.69	749.29	274.01
263	65	55	-13.7	-27.3	187.69	749.29	274.01
264	65	35	-13.7	-42.3	187.69	1789.29	579.51
265	75	55	- 3.7	-27.3	13.69	749.29	101.01
266	85	65	6.3	-12.3	39.69	151.29	- 77.49
267	75	55	-3.7	-27.3	13.69	749.29	101.01
268	75	75	- 3.7	- 2.3	13.69	5.29	8.51
269	75	65	- 3.7	-12.3	13.69	151.29	45.51
270	75	55	- 3.7	-27.3	13.69	249.29	101.01
271	75	65	- 3.7	-12.3	13.69	151.29	45.51
272	65	65	-13.7	-12.3	187.69	151.29	168.51
273	65	35	-13.7	-42.3	187.69	1789.29	579.51
274	75	55	- 3.7	-27.3	13.69	749.29	101.01
275	85	85	6.3	7.7	39.69	59.29	48.51
276	65	75	-13.7	- 2.3	13.69	5.29	31.51
277	75	65	- 3.7	-12.3	13.69	151.29	45.51
278	75	75	- 3.7	- 2.3	13.69	5.29	8.51
279	75	35	- 3.7	-42.3	13.69	1789.29	156.51
280	65	65	-13.7	-12.3	187.69	151.29	168.51
281	75	65	- 3.7	-12.3	13.69	151.29	45.51
279	21965	21565			17,350.82	41,555.91	9,438.77

78.7 77.3

17,580.88 41,506.91 2,428.77

No.	X	Y	X	Y	X	Y	X	Y
839	65	65	6.3	7.7	65	65	65	65
840	65	75	6.3	- 6.3	75	65	65	- 14.49
841	65	65	6.3	7.7	65	65	65	65
842	75	65	- 6.7	- 12.3	65	75	151.39	45.51
843	65	65	16.3	17.7	65	65	118.39	386.51
844	75	65	- 6.7	17.7	65	75	212.39	- 65.49
845	65	65	16.3	17.7	65	65	212.39	386.51
846	75	65	6.3	- 6.3	65	75	6.39	- 14.49
847	65	65	- 12.7	7.7	65	65	65	- 106.49
848	65	65	6.3	7.7	65	65	65	48.51
849	75	65	- 6.7	7.7	65	75	65	- 38.49
850	65	75	- 6.3	- 6.3	75	65	6.39	- 14.49
851	65	65	6.3	7.7	65	65	65	65
852	65	65	- 6.3	- 6.3	75	65	6.39	- 14.49
853	65	65	6.3	17.7	65	65	212.39	111.51
854	75	65	- 6.7	7.7	65	75	65	- 38.49
855	65	65	16.3	7.7	65	65	65	122.51
856	75	65	- 6.7	7.7	65	75	65	6.51
857	65	75	- 6.3	- 6.3	65	65	65	- 38.49
858	65	65	- 12.7	- 48.3	65	65	1789.39	678.51
859	65	65	6.3	- 6.3	75	65	6.39	- 14.49
860	65	75	6.3	- 6.3	65	65	6.39	- 14.49
861	75	65	- 6.7	- 6.3	75	65	6.39	6.51
862	65	65	- 12.7	- 27.3	65	65	187.39	874.01
863	65	65	- 12.7	- 27.3	65	65	187.39	874.01
864	65	65	- 12.7	- 42.3	65	65	1789.39	678.51
865	75	65	- 6.7	- 27.3	65	75	749.39	101.01
866	65	65	6.3	- 12.3	65	65	151.39	- 77.49
867	75	65	- 6.7	- 27.3	65	75	749.39	101.01
868	65	75	- 6.3	- 6.3	65	65	6.39	6.51
869	75	65	- 6.7	- 12.3	65	75	151.39	45.51
870	65	75	- 6.7	- 27.3	65	65	849.39	101.01
871	75	65	- 6.7	- 12.3	65	75	151.39	45.51
872	65	65	- 12.7	- 12.3	65	65	187.39	188.51
873	65	65	- 12.7	- 42.3	65	65	1789.39	678.51
874	75	65	- 6.7	- 27.3	65	75	749.39	101.01
875	65	65	6.3	7.7	65	65	65	48.51
876	65	65	- 12.7	- 6.3	75	65	6.39	31.51
877	75	65	- 6.7	- 12.3	65	75	151.39	45.51
878	65	75	- 6.3	- 6.3	65	65	6.39	6.51
879	75	65	- 6.7	- 42.3	65	75	1789.39	156.51
880	65	65	- 12.7	- 12.3	65	65	187.39	188.51
881	75	65	- 6.7	- 12.3	65	75	151.39	45.51

TABLE VIII c (1982)
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TABLE VIII c (1936)

Correlating:

$$r = \frac{\sum xy}{\sqrt{\sum x^2} \times \sqrt{\sum y^2}} = \frac{9,438.77}{\sqrt{17,350.82} \times \sqrt{41,555.91}}$$

$$r = \frac{9,438.77}{131.7 \times 203.8} = \frac{9,438.77}{26,840.5}$$

$$r = .352$$

$$P.E._r = \frac{.6745 \times (1-r^2)}{\sqrt{N}} = \frac{.6745 \times (1-.1239)}{\sqrt{279}}$$

$$P.E._r = \frac{.5909}{16.7} = .035$$

Correlation:

$$r = \frac{\sum x^2}{\sqrt{\sum x^2 \times \sum x^2}} = \frac{9,438.77}{\sqrt{117,320.62 \times 16,883.14}} = .582$$

$$r = \frac{9,438.77}{\sqrt{121.7 \times 202.8}} = .582$$

$$r = .582$$

$$r = \frac{.8746 \times (1 - r^2)}{\sqrt{.8746 \times (1 - .582^2)}} = .8746$$

$$r = \frac{.8746}{.8746} = .8746$$

TABLE VIII d (1935)

Correlation of High School Average and Algebra Final Grade

No.	X	Y	x	y	x ²	y ²	xy
1	65	Same as	-13.4	-13	179.56	Same as	174.2
2	75	III d	- 3.4	7	11.56	III d	- 23.8
3	75		- 3.4	- 3	11.56		10.2
4	85		6.6	- 3	43.56		- 19.8
5	95		16.6	7	275.56		116.2
6	65		-13.4	-13	179.56		174.2
7	85		6.6	-13	43.56		- 85.8
8	85		6.6	7	43.56		46.2
9	75		- 3.4	17	11.56		- 57.8
10	75		- 3.4	7	11.56		- 23.8
11	65		-13.4	-13	179.56		174.2
12	85		6.6	7	43.56		46.2
13	85		6.6	7	43.56		46.2
14	85		6.6	7	43.56		46.2
15	85		6.6	- 3	43.56		- 19.8
16	75		- 3.4	7	11.56		- 23.8
17	75		- 3.4	- 3	11.56		10.2
18	65		-13.4	17	179.56		-295.8
19	85		6.6	7	43.56		46.2
20	75		- 3.4	- 3	11.56		10.2
21	95		16.6	17	275.56		282.2
22	75		- 3.4	- 3	11.56		10.2
23	95		16.6	7	275.56		116.2
24	85		6.6	-28	43.56		-184.8
25	75		- 3.4	- 3	11.56		10.2
26	75		-3.4	17	11.56		- 57.8
27	85		6.6	17	43.56		112.2
28	75		- 3.4	- 3	11.56		10.2
29	75		- 3.4	7	11.56		- 23.8
30	75		- 3.4	- 3	11.56		10.2
31	95		16.6	7	275.56		116.2
32	85		6.6	- 3	43.56		- 19.8
33	85		6.6	7	43.56		46.2
34	85		6.6	7	43.56		46.2
35	75		- 3.4	7	11.56		- 23.8
36	75		- 3.4	17	11.56		-57.8
37	75		- 3.4	-13	11.56		44.2
38	75		- 3.4	7	11.56		- 23.8
39	85		6.6	17	43.56		-112.2
40	85		6.6	- 3	43.56		- 19.8
41	75		- 3.4	-13	11.56		44.2
42	65		-13.4	-13	179.56		174.2
43	75		- 3.4	-13	11.56		44.2
44	85		6.6	-13	43.56		- 85.8
45	75		- 3.4	17	11.56		- 57.8
46	85		6.6	-28	43.56		-184.8

TABLE VIII a (1935)

Correlation of High School Average and Algebra Final Grade

No.	X	Y	X	Y	X	Y
1	85	Same as	179.50	179.50	Same as	179.50
2	78	111.4	11.50	11.50	111.4	11.50
3	78	-	11.50	11.50	-	11.50
4	85	8.0	43.50	43.50	8.0	43.50
5	95	16.0	275.50	275.50	16.0	275.50
6	85	-13.4	179.50	179.50	-13.4	179.50
7	85	6.0	43.50	43.50	6.0	43.50
8	85	6.0	43.50	43.50	6.0	43.50
9	75	-3.4	11.50	11.50	-3.4	11.50
10	75	-3.4	11.50	11.50	-3.4	11.50
11	65	-13.4	179.50	179.50	-13.4	179.50
12	85	6.0	43.50	43.50	6.0	43.50
13	85	6.0	43.50	43.50	6.0	43.50
14	85	6.0	43.50	43.50	6.0	43.50
15	85	6.0	43.50	43.50	6.0	43.50
16	75	-3.4	11.50	11.50	-3.4	11.50
17	75	-3.4	11.50	11.50	-3.4	11.50
18	65	-13.4	179.50	179.50	-13.4	179.50
19	85	6.0	43.50	43.50	6.0	43.50
20	75	-3.4	11.50	11.50	-3.4	11.50
21	95	16.0	275.50	275.50	16.0	275.50
22	75	-3.4	11.50	11.50	-3.4	11.50
23	95	16.0	275.50	275.50	16.0	275.50
24	85	6.0	43.50	43.50	6.0	43.50
25	75	-3.4	11.50	11.50	-3.4	11.50
26	75	-3.4	11.50	11.50	-3.4	11.50
27	85	6.0	43.50	43.50	6.0	43.50
28	75	-3.4	11.50	11.50	-3.4	11.50
29	75	-3.4	11.50	11.50	-3.4	11.50
30	75	-3.4	11.50	11.50	-3.4	11.50
31	95	16.0	275.50	275.50	16.0	275.50
32	85	6.0	43.50	43.50	6.0	43.50
33	85	6.0	43.50	43.50	6.0	43.50
34	85	6.0	43.50	43.50	6.0	43.50
35	75	-3.4	11.50	11.50	-3.4	11.50
36	75	-3.4	11.50	11.50	-3.4	11.50
37	75	-3.4	11.50	11.50	-3.4	11.50
38	75	-3.4	11.50	11.50	-3.4	11.50
39	85	6.0	43.50	43.50	6.0	43.50
40	85	6.0	43.50	43.50	6.0	43.50
41	75	-3.4	11.50	11.50	-3.4	11.50
42	65	-13.4	179.50	179.50	-13.4	179.50
43	75	-3.4	11.50	11.50	-3.4	11.50
44	85	6.0	43.50	43.50	6.0	43.50
45	75	-3.4	11.50	11.50	-3.4	11.50
46	85	6.0	43.50	43.50	6.0	43.50

TABLE VIII d (1935)

No.	X	Y	x	y	x ²	y ²	xy
47	85	Same as	6.6	7	43.56	Same as	46.2
48	75	III d -	3.4	17	11.56	-	57.8
49	85		6.6	- 3	43.56	-	19.8
50	75		- 3.4	7	11.56	-	23.8
51	85		6.6	7	43.56		46.2
52	75		- 3.4	-13	11.56		44.2
53	95		16.6	17	275.56		282.2
54	75		- 3.4	-13	11.56		44.2
55	75		- 3.4	7	11.56	-	23.8
56	85		6.6	17	43.56		112.2
57	75		- 3.4	7	11.56	-	23.8
58	75		- 3.4	- 3	11.56		10.2
59	75		- 3.4	-13	11.56		44.2
60	85		6.6	- 3	43.56	-	19.8
61	75		- 3.4	-28	11.56		95.2
62	85		6.6	7	43.56		46.2
63	85		6.6	-13	43.56	-	85.8
64	75		- 3.4	7	11.56	-	23.8
65	85		6.6	-28	43.56	-184.8	
66	75		- 3.4	7	11.56	-	23.8
67	75		- 3.4	- 3	11.56		10.2
68	75		- 3.4	7	11.56		23.8
69	75		- 3.4	-13	11.56		44.2
70	65		-13.4	- 3	179.56		40.2
71	85		6.6	- 3	43.56	-	19.8
72	75		- 3.4	- 3	11.56		10.2
73	85		6.6	7	43.56		46.2
74	95		16.6	7	275.56		116.2
75	85		6.6	- 3	43.56	-	19.8
76	85		6.6	- 3	43.56	-	19.8
77	75		- 3.4	7	11.56	-	23.8
78	75		- 3.4	- 3	11.56		10.2
79	75		- 3.4	- 3	11.56		10.2
80	65		-13.4	- 3	179.56		40.2
81	75		- 3.4	-28	11.56		95.2
82	85		6.6	7	43.56		46.2
83	85		6.6	17	43.56		112.2
84	75		- 3.4	7	11.56	-	23.8
85	75		- 3.4	7	11.56	-	23.8
86	85		6.6	17	43.56		112.2
87	85		6.6	-28	43.56	-184.8	
88	75		- 3.4	17	11.56	-	57.8
89	--		---	--	---		---
90	75		- 3.4	-13	11.56		44.2
91	65		-13.4	-13	179.56		174.2
92	85		6.6	- 3	43.56	-	19.8
93	75		- 3.4	-13	11.56		44.2
94	85		6.6	7	43.56		46.2

TABLE VIII (1930)

No.	X	Y	X	Y	X	Y
47	86		8.8		86	
48	75	- 3.4	11.5		87	
49	85	8.8	3		88	
50	75	- 3.4	7		89	
51	85	8.8	7		90	
52	75	- 3.4	-13		91	
53	95	18.8	17		92	
54	75	- 3.4	-13		93	
55	75	- 3.4	7		94	
56	85	8.8	17		95	
57	75	- 3.4	7		96	
58	75	- 3.4	3		97	
59	75	- 3.4	-13		98	
60	85	8.8	3		99	
61	75	- 3.4	-28		100	
62	85	8.8	7		101	
63	85	8.8	-13		102	
64	75	- 3.4	7		103	
65	85	8.8	-28		104	
66	75	- 3.4	7		105	
67	75	- 3.4	3		106	
68	75	- 3.4	7		107	
69	75	- 3.4	-13		108	
70	85	-18.4	3		109	
71	85	8.8	3		110	
72	75	- 3.4	3		111	
73	85	8.8	7		112	
74	95	18.8	7		113	
75	85	8.8	3		114	
76	85	8.8	3		115	
77	75	- 3.4	7		116	
78	75	- 3.4	3		117	
79	75	- 3.4	3		118	
80	85	-18.4	3		119	
81	75	- 3.4	-28		120	
82	85	8.8	7		121	
83	85	8.8	17		122	
84	75	- 3.4	7		123	
85	75	- 3.4	7		124	
86	85	8.8	17		125	
87	85	8.8	-28		126	
88	75	- 3.4	17		127	
89	--	--	--		128	
90	75	- 3.4	-13		129	
91	85	-18.4	-13		130	
92	85	8.8	3		131	
93	75	- 3.4	-13		132	
94	85	8.8	7		133	

TABLE VIII d (1935)

No.	X	Y	x	y	x ²	y ²	xy
95	85	Same as	6.6	- 3	43.56	Same as	- 19.8
96	65	III d	-13.4	- 3	179.56	III d	40.2
97	75		- 3.4	-13	11.56		44.2
98	75		- 3.4	- 3	11.56		10.2
99	75		- 3.4	7	11.56		- 23.8
100	65		-13.4	-13	179.56		174.2
101	75		- 3.4	- 3	11.56		10.2
102	85		6.6	-28	43.56		-184.8
103	95		16.6	7	275.56		116.2
104	65		-13.4	7	179.56		- 93.8
105	75		- 3.4	-13	11.56		44.2
106	75		- 3.4	7	11.56		- 23.8
107	75		- 3.4	7	11.56		- 23.8
108	85		6.6	- 3	43.56		- 19.8
109	65		-13.4	7	179.56		- 93.8
110	75		- 3.4	- 3	11.56		10.2
111	85		6.6	- 3	43.56		- 19.8
112	85		6.6	-13	43.56		- 85.8
113	75		- 3.4	-13	11.56		44.2
114	75		- 3.4	7	11.56		- 23.8
115	85		6.6	17	43.56		112.2
116	85		6.6	- 3	43.56		- 19.8
117	65		-13.4	- 3	179.56		40.2
118	65		-13.4	7	179.56		- 93.8
119	65		-13.4	- 3	179.56		40.2
120	75		- 3.4	7	11.56		- 23.8
121	85		6.6	17	43.56		112.2
122	85		6.6	7	43.56		46.2
123	75		- 3.4	-13	11.56		44.2
124	85		6.6	7	43.56		46.2
125	75		- 3.4	7	11.56		- 23.8
126	75		- 3.4	- 3	11.56		10.2
127	55		-23.4	- 3	547.56		70.2
128	85		6.6	7	43.56		46.2
129	75		- 3.4	17	11.56		- 57.8
130	65		-13.4	- 3	179.56		40.2
131	95		16.6	7	275.56		116.2
132	75		- 3.4	- 3	11.56		10.2
133	65		-13.4	- 3	179.56		40.2
134	75		- 3.4	- 3	11.56		10.2
135	75		- 3.4	17	11.56		- 57.8
136	85		6.6	7	43.56		46.2
137	75		- 3.4	-13	11.56		44.2
138	85		6.6	-13	43.56		- 85.8
139	75		-3.4	7	11.56		- 23.8
140	85		6.6	7	43.56		46.2
141	75		- 3.4	17	11.56		- 57.8
142	85		6.6	-13	43.56		- 85.8

TABLE VIII (1933)

W	X	Y	Z	W	X	Y	Z
142	88	6.8	-12	43.88	11.88	11.88	88.8
141	78	8.4	-11	43.88	11.88	11.88	88.8
140	88	6.8	-7	43.88	11.88	11.88	88.8
139	78	8.4	-12	43.88	11.88	11.88	88.8
138	88	6.8	-13	43.88	11.88	11.88	88.8
137	78	8.4	-13	43.88	11.88	11.88	88.8
136	88	6.8	-13	43.88	11.88	11.88	88.8
135	78	8.4	-13	43.88	11.88	11.88	88.8
134	88	6.8	-13	43.88	11.88	11.88	88.8
133	78	8.4	-13	43.88	11.88	11.88	88.8
132	88	6.8	-13	43.88	11.88	11.88	88.8
131	78	8.4	-13	43.88	11.88	11.88	88.8
130	88	6.8	-13	43.88	11.88	11.88	88.8
129	78	8.4	-13	43.88	11.88	11.88	88.8
128	88	6.8	-13	43.88	11.88	11.88	88.8
127	78	8.4	-13	43.88	11.88	11.88	88.8
126	88	6.8	-13	43.88	11.88	11.88	88.8
125	78	8.4	-13	43.88	11.88	11.88	88.8
124	88	6.8	-13	43.88	11.88	11.88	88.8
123	78	8.4	-13	43.88	11.88	11.88	88.8
122	88	6.8	-13	43.88	11.88	11.88	88.8
121	78	8.4	-13	43.88	11.88	11.88	88.8
120	88	6.8	-13	43.88	11.88	11.88	88.8
119	78	8.4	-13	43.88	11.88	11.88	88.8
118	88	6.8	-13	43.88	11.88	11.88	88.8
117	78	8.4	-13	43.88	11.88	11.88	88.8
116	88	6.8	-13	43.88	11.88	11.88	88.8
115	78	8.4	-13	43.88	11.88	11.88	88.8
114	88	6.8	-13	43.88	11.88	11.88	88.8
113	78	8.4	-13	43.88	11.88	11.88	88.8
112	88	6.8	-13	43.88	11.88	11.88	88.8
111	78	8.4	-13	43.88	11.88	11.88	88.8
110	88	6.8	-13	43.88	11.88	11.88	88.8
109	78	8.4	-13	43.88	11.88	11.88	88.8
108	88	6.8	-13	43.88	11.88	11.88	88.8
107	78	8.4	-13	43.88	11.88	11.88	88.8
106	88	6.8	-13	43.88	11.88	11.88	88.8
105	78	8.4	-13	43.88	11.88	11.88	88.8
104	88	6.8	-13	43.88	11.88	11.88	88.8
103	78	8.4	-13	43.88	11.88	11.88	88.8
102	88	6.8	-13	43.88	11.88	11.88	88.8
101	78	8.4	-13	43.88	11.88	11.88	88.8
100	88	6.8	-13	43.88	11.88	11.88	88.8
99	78	8.4	-13	43.88	11.88	11.88	88.8
98	88	6.8	-13	43.88	11.88	11.88	88.8
97	78	8.4	-13	43.88	11.88	11.88	88.8
96	88	6.8	-13	43.88	11.88	11.88	88.8
95	78	8.4	-13	43.88	11.88	11.88	88.8

TABLE VIII d (1935)

No.	X	Y	x	y	x ²	y ²	xy
143	75	Same as	- 3.4	7	11.56	Same as	- 23.8
144	75	III d	- 3.4	- 3	11.56	III d	10.2
145	85		6.6	17	43.56		112.2
146	85		6.6	-43	43.56		-283.8
147	75		- 3.4	7	11.56		- 23.8
148	85		6.6	- 3	43.56		- 19.8
149	75		-3.4	- 3	11.56		10.2
150	85		6.6	-28	43.56		-184.8
151	75		- 3.4	-43	11.56		146.2
152	85		6.6	- 3	43.56		- 19.8
153	65		-13.4	- 3	179.56		40.2
154	85		6.6	- 3	43.56		- 19.8
155	85		6.6	-13	43.56		- 85.8
156	75		- 3.4	- 3	11.56		10.2
157	75		- 3.4	7	11.56		- 23.8
158	85		6.6	7	43.56		46.2
159	85		6.6	17	43.56		112.2
160	75		-3.4	7	11.56		- 23.8
161	75		- 3.4	-13	11.56		44.2
162	75		- 3.4	-13	11.56		44.2
163	75		- 3.4	7	11.56		- 23.8
164	75		- 3.4	- 3	11.56		10.2
165	85		6.6	7	43.56		46.2
166	85		6.6	7	43.56		46.2
167	75		- 3.4	7	11.56		- 23.8
168	75		- 3.4	- 3	11.56		10.2
169	85		6.6	7	43.56		46.2
170	75		- 3.4	17	11.56		- 57.8
171	75		- 3.4	-13	11.56		44.2
172	65		-13.4	17	179.56		-295.8
173	95		16.6	7	275.56		116.2
174	75		- 3.4	7	11.56		- 23.8
175	85		6.6	- 3	43.56		- 19.8
176	75		- 3.4	- 3	11.56		10.2
177	75		- 3.4	-13	11.56		44.2
178	75		- 3.4	7	11.56		- 23.8
179	85		6.6	7	43.56		46.2
180	75		- 3.4	17	11.56		- 57.8
181	75		- 3.4	-28	11.56		95.2
182	75		- 3.4	7	11.56		- 23.8
183	75		- 3.4	-13	11.56		44.2
184	75		- 3.4	- 3	11.56		10.2
185	75		- 3.4	-13	11.56		44.2
186	75		- 3.4	17	11.56		- 57.8
187	85		6.6	17	43.56		112.2
188	85		6.6	7	43.56		46.2
189	75		- 3.4	7	11.56		- 23.8
190	85		6.6	- 3	43.56		- 19.8

TABLE VIII A (1935)

No.	X	Y	X	Y	X	Y	X	Y
143	75	Same as	7	11.55	11.55	Same as	8.33	-
144	75	111 4	3	-	11.55	111 4	10.3	10.3
145	85		17	6.5	43.55		115.3	
146	85		14	6.5	43.55		115.3	-
147	75	-	7	6.4	11.55		88.8	-
148	85		3	6.5	43.55		19.8	-
149	75	-	3	-	11.55		10.3	10.3
150	85		13	6.5	43.55		184.8	-
151	75	-	14	6.4	11.55		146.3	-
152	85		3	6.5	43.55		19.8	-
153	85	-	3	-	11.55		40.3	40.3
154	85		3	6.5	43.55		19.8	-
155	85		13	6.5	43.55		88.8	-
156	75	-	3	-	11.55		10.3	10.3
157	75	-	7	6.4	11.55		83.8	-
158	85		7	6.5	43.55		45.3	45.3
159	85		17	6.5	43.55		115.3	115.3
160	75	-	7	6.4	11.55		83.8	-
161	75	-	13	6.4	11.55		44.3	44.3
162	75	-	13	6.4	11.55		44.3	44.3
163	75	-	7	6.4	11.55		83.8	-
164	75	-	3	-	11.55		10.3	10.3
165	85		7	6.5	43.55		45.3	45.3
166	85		7	6.5	43.55		45.3	45.3
167	75	-	7	6.4	11.55		83.8	-
168	75	-	3	-	11.55		10.3	10.3
169	85		7	6.5	43.55		45.3	45.3
170	75	-	17	6.4	11.55		87.8	-
171	75	-	13	6.4	11.55		44.3	44.3
172	85	-	17	6.4	11.55		83.8	-
173	85	18.5	7	6.5	43.55		115.3	115.3
174	75	-	7	6.4	11.55		83.8	-
175	85		3	6.5	43.55		19.8	-
176	75	-	3	-	11.55		10.3	10.3
177	75	-	13	6.4	11.55		44.3	44.3
178	75	-	7	6.4	11.55		83.8	-
179	85		7	6.5	43.55		45.3	45.3
180	75	-	17	6.4	11.55		87.8	-
181	75	-	13	6.4	11.55		88.8	-
182	75	-	7	6.4	11.55		83.8	-
183	75	-	13	6.4	11.55		44.3	44.3
184	75	-	3	-	11.55		10.3	10.3
185	75	-	13	6.4	11.55		44.3	44.3
186	75	-	17	6.4	11.55		87.8	-
187	85		17	6.5	43.55		115.3	115.3
188	85		7	6.5	43.55		45.3	45.3
189	75	-	7	6.4	11.55		83.8	-
190	85		3	6.5	43.55		19.8	-

TABLE VIII d (1935)

No.	X	Y	x	y	x ²	y ²	xy
191	75	Same	- 3.4	- 3	11.56	Same as	10.2
192	85	as III d	6.6	7	43.56	III d	46.2
193	85		6.6	7	43.56		46.2
194	75		- 3.4	17	11.56		- 57.8
195	75		- 3.4	- 3	11.56		10.2
194	15,210	15,135			10,435.09	27,961	2,563.6

78.4 78.

$$\text{Correlating : } r = \frac{- \sum xy}{\sqrt{\sum x^2} \times \sqrt{\sum y^2}} = \frac{2563.6}{\sqrt{10435.09} \times \sqrt{27691.}}$$

$$r = \frac{2563.6}{102.15 \times 167.21} = \frac{2563.6}{17,080.50} = .1501$$

$$\text{P.E.}_r = \frac{.6745 \times (1-r^2)}{\sqrt{N}} = \frac{.6745 \times (1-.1501^2)}{\sqrt{194}}$$

$$\text{P.E.}_r = \frac{.6745 \times (1-.0225)}{\sqrt{194}} = \frac{.6745 \times .9975}{\sqrt{194}}$$

$$\text{P.E.}_r = \frac{.6593}{\sqrt{194}} = \frac{.6593}{13.92} = .047$$

TABLE VIII d (1955)

St.	I	Y	X	Y	X	Y ²	XY
191	75	Same as	- 3.4	- 3	11.56	Same as	10.8
192	85	as 111 d	5.8	7	43.86	111 d	48.2
193	85		6.8	7	43.86		48.2
194	75		- 3.4	17	11.56		- 57.8
195	75		- 3.4	8	11.56		10.8
196	15, 19, 10, 195				10, 438.09	54, 961	8, 853.8

76.4 78.

$$\text{Correlating: } r = \frac{\sum XY}{\sqrt{\sum X^2} \sqrt{\sum Y^2}} = \frac{2563.8}{\sqrt{10438.09} \times \sqrt{12781.21}} = .1501$$

$$r = \frac{2563.8}{\sqrt{10438.09} \times \sqrt{12781.21}} = .1501$$

$$P.E. r = \frac{\sqrt{1 - r^2}}{\sqrt{N}} = \frac{\sqrt{1 - (.1501)^2}}{\sqrt{194}} = .047$$

$$P.E. r = \frac{\sqrt{1 - r^2}}{\sqrt{N}} = \frac{\sqrt{1 - (.1501)^2}}{\sqrt{194}} = .047$$

$$P.E. r = \frac{\sqrt{1 - r^2}}{\sqrt{N}} = \frac{\sqrt{1 - (.1501)^2}}{\sqrt{194}} = .047$$

TABLE VIII e (1934)

Correlation of High School Average and Algebra Final Grade

No.	X	Y	x	y	x ²	y ²	xy
1	95	Same as	17	16	289	Same as	272
2	95	Table	17	6	289	Table	102
3	85	III e	7	16	49	III e	112
4	85		7	- 4	49		- 28
5	95		17	16	289		272
6	75		- 3	- 4	9		12
7	75		- 3	- 4	9		12
8	65		-13	-14	169		182
9	65		-13	- 4	169		52
10	65		-13	16	169		-208
11	75		- 3	- 4	9		12
12	75		- 3	6	9		- 18
13	95		17	6	289		102
14	75		- 3	16	9		- 48
15	85		7	6	49		42
16	75		-3	6	9		- 18
17	75		- 3	- 4	9		12
18	65		-13	- 4	169		52
19	85		7	6	49		42
20	65		-13	- 4	169		52
21	75		- 3	6	9		- 18
22	85		7	- 4	49		- 28
23	85		7	- 4	49		- 28
24	95		17	-14	289		-238
25	65		-13	- 4	169		52
26	75		- 3	- 4	9		12
27	75		- 3	-29	9		87
28	85		7	16	49		112
29	75		- 3	6	9		- 18
30	75		- 3	- 4	9		12
31	95		17	6	289		102
32	75		- 3	-29	9		87
33	85		7	6	49		42
34	75		- 3	- 4	9		12
35	75		- 3	- 4	9		12
36	85		7	6	49		42
37	85		7	6	49		42
38	75		- 3	16	9		- 48
39	75		- 3	-14	9		42
40	75		- 3	-14	9		42
41	85		7	- 4	49		- 28
42	75		- 3	- 4	9		12
43	75		- 3	-14	9		42
44	75		- 3	-4	9		12
45	75		- 3	-14	9		42
46	75		- 3	6	9		- 18

TABLE VII - (1934)

Correlation of High School Averages and Algebra Final Grade

No.	X	Y	X	Y	X	Y
1	85	85	17	16	85	85
2	85	85	17	6	85	85
3	85	85	7	16	85	85
4	85	85	7	-4	85	85
5	85	85	17	16	85	85
6	75	75	-3	-4	85	85
7	75	75	-3	-4	85	85
8	85	85	-13	-14	85	85
9	85	85	-13	-4	85	85
10	85	85	-13	16	85	85
11	75	75	-3	-4	85	85
12	75	75	-3	6	85	85
13	85	85	17	6	85	85
14	75	75	-3	16	85	85
15	85	85	7	6	85	85
16	75	75	-3	6	85	85
17	75	75	-3	-4	85	85
18	85	85	-13	-4	100	100
19	85	85	7	6	49	49
20	85	85	-13	-4	100	100
21	75	75	-3	6	9	9
22	85	85	7	-4	49	49
23	85	85	7	-4	49	49
24	85	85	17	-14	85	85
25	85	85	-13	-4	100	100
26	75	75	-3	-4	9	9
27	75	75	-3	-39	9	9
28	85	85	7	16	49	49
29	75	75	-3	6	9	9
30	75	75	-3	-4	9	9
31	85	85	17	6	85	85
32	75	75	-3	-39	9	9
33	85	85	7	6	49	49
34	75	75	-3	-4	9	9
35	75	75	-3	-4	9	9
36	85	85	7	6	49	49
37	85	85	7	6	49	49
38	75	75	-3	16	9	9
39	75	75	-3	-14	9	9
40	75	75	-3	-14	9	9
41	85	85	7	-4	49	49
42	75	75	-3	-4	9	9
43	75	75	-3	-14	9	9
44	75	75	-3	-4	9	9
45	75	75	-3	-14	9	9
46	75	75	-3	6	9	9

TABLE VIII e (1934)

No.	X	Y	x	y	x ²	y ²	xy
47	75		- 3	- 4	9		12
48	75		- 3	-14	9		42
49	85		7	6	49		42
50	75		- 3	-29	9		87
51	95		17	6	289		102
52	75		- 3	- 4	9		12
53	75		- 3	6	9		- 18
54	65		-13	- 4	169		52
55	75		- 3	6	9		- 18
56	75		- 3	6	9		- 18
57	85		7	6	49		42
58	75		- 3	- 4	9		12
59	75		- 3	6	9		- 18
60	75		- 3	- 4	9		12
61	75		- 3	-29	9		87
62	85		7	6	49		42
63	75		- 3	- 4	9		12
64	75		- 3	- 4	9		12
65	85		7	-14	49		- 98
66	75		- 3	-29	9		57
67	75		- 3	16	9		- 48
68	85		7	6	49		42
69	75		- 3	6	9		- 18
70	75		- 3	- 4	9		12
71	75		- 3	- 4	9		12
72	75		- 3	6	9		- 18
73	75		- 3	-14	9		42
74	75		- 3	6	9		- 18
75	95		17	16	289		272
76	75		- 3	6	9		- 18
77	75		- 3	-14	9		42
78	75		- 3	6	9		- 18
79	75		- 3	6	9		- 18
80	65		-13	6	169		- 78
81	75		- 3	- 4	9		12
82	85		7	6	49		42
83	65		-13	6	169		- 78
84	65		-13	- 4	169		52
85	85		7	- 4	49		- 28
86	85		7	6	49		42
87	95		17	6	289		102
88	75		- 3	16	9		- 48
89	85		7	-14	49		- 98
90	85		7	16	49		112
91	75		- 3	6	9		- 18
92	65		-13	- 4	169		52
93	65		-13	-14	169		182
94	75		- 3	-14	9		42

TABLE VIII (Contd.)

NO.	X	Y	Z	X	Y	Z
74	75	-	2	-	2	81
75	75	-	2	-	2	82
76	75	-	2	-	2	83
77	75	-	2	-	2	84
78	75	-	2	-	2	85
79	75	-	2	-	2	86
80	75	-	2	-	2	87
81	75	-	2	-	2	88
82	75	-	2	-	2	89
83	75	-	2	-	2	90
84	75	-	2	-	2	91
85	75	-	2	-	2	92
86	75	-	2	-	2	93
87	75	-	2	-	2	94
88	75	-	2	-	2	95
89	75	-	2	-	2	96
90	75	-	2	-	2	97
91	75	-	2	-	2	98
92	75	-	2	-	2	99
93	75	-	2	-	2	100
94	75	-	2	-	2	101
95	75	-	2	-	2	102
96	75	-	2	-	2	103
97	75	-	2	-	2	104
98	75	-	2	-	2	105
99	75	-	2	-	2	106
100	75	-	2	-	2	107
101	75	-	2	-	2	108
102	75	-	2	-	2	109
103	75	-	2	-	2	110
104	75	-	2	-	2	111
105	75	-	2	-	2	112
106	75	-	2	-	2	113
107	75	-	2	-	2	114
108	75	-	2	-	2	115
109	75	-	2	-	2	116
110	75	-	2	-	2	117
111	75	-	2	-	2	118
112	75	-	2	-	2	119
113	75	-	2	-	2	120
114	75	-	2	-	2	121
115	75	-	2	-	2	122
116	75	-	2	-	2	123
117	75	-	2	-	2	124
118	75	-	2	-	2	125
119	75	-	2	-	2	126
120	75	-	2	-	2	127
121	75	-	2	-	2	128
122	75	-	2	-	2	129
123	75	-	2	-	2	130
124	75	-	2	-	2	131
125	75	-	2	-	2	132
126	75	-	2	-	2	133
127	75	-	2	-	2	134
128	75	-	2	-	2	135
129	75	-	2	-	2	136
130	75	-	2	-	2	137
131	75	-	2	-	2	138
132	75	-	2	-	2	139
133	75	-	2	-	2	140
134	75	-	2	-	2	141
135	75	-	2	-	2	142
136	75	-	2	-	2	143
137	75	-	2	-	2	144
138	75	-	2	-	2	145
139	75	-	2	-	2	146
140	75	-	2	-	2	147
141	75	-	2	-	2	148
142	75	-	2	-	2	149
143	75	-	2	-	2	150
144	75	-	2	-	2	151
145	75	-	2	-	2	152
146	75	-	2	-	2	153
147	75	-	2	-	2	154
148	75	-	2	-	2	155
149	75	-	2	-	2	156
150	75	-	2	-	2	157
151	75	-	2	-	2	158
152	75	-	2	-	2	159
153	75	-	2	-	2	160
154	75	-	2	-	2	161
155	75	-	2	-	2	162
156	75	-	2	-	2	163
157	75	-	2	-	2	164
158	75	-	2	-	2	165
159	75	-	2	-	2	166
160	75	-	2	-	2	167
161	75	-	2	-	2	168
162	75	-	2	-	2	169
163	75	-	2	-	2	170
164	75	-	2	-	2	171
165	75	-	2	-	2	172
166	75	-	2	-	2	173
167	75	-	2	-	2	174
168	75	-	2	-	2	175
169	75	-	2	-	2	176
170	75	-	2	-	2	177
171	75	-	2	-	2	178
172	75	-	2	-	2	179
173	75	-	2	-	2	180
174	75	-	2	-	2	181
175	75	-	2	-	2	182
176	75	-	2	-	2	183
177	75	-	2	-	2	184
178	75	-	2	-	2	185
179	75	-	2	-	2	186
180	75	-	2	-	2	187
181	75	-	2	-	2	188
182	75	-	2	-	2	189
183	75	-	2	-	2	190
184	75	-	2	-	2	191
185	75	-	2	-	2	192
186	75	-	2	-	2	193
187	75	-	2	-	2	194
188	75	-	2	-	2	195
189	75	-	2	-	2	196
190	75	-	2	-	2	197
191	75	-	2	-	2	198
192	75	-	2	-	2	199
193	75	-	2	-	2	200

TABLE VIII e (1934)

No.	X	Y	x	y	x ²	y ²	xy
95	65		-13	- 4	169		52
96	85		7	6	49		42
97	75		- 3	- 4	9		12
98	75		- 3	- 4	9		12
99	75		- 3	- 4	9		12
100	75		- 3	- 4	9		12
101	65		-13	- 4	169		52
102	75		- 3	6	9		- 18
103	65		-13	6	169		- 78
104	75		- 3	- 4	9		12
105	75		- 3	-14	9		42
106	85		7	6	49		42
107	75		- 3	6	9		- 18
108	65		-13	6	169		- 78
109	85		7	6	49		42
110	75		- 3	6	9		- 18
111	85		7	-14	49		- 98
112	75		- 3	6	9		- 18
113	85		7	- 4	49		- 28
114	75		- 3	16	9		- 48
115	75		-3	16	9		- 48
116	85		7	- 4	49		- 28
117	85		7	- 4	49		- 28
118	75		-3	16	9		- 48
119	75		- 3	16	9		- 48
120	75		- 3	6	9		- 18
121	75		- 3	6	9		- 18
122	75		- 3	6	9		- 18
123	85		7	16	49		102
124	75		- 3	6	9		- 18
125	75		- 3	-29	9		87
126	75		- 3	6	9		- 18
126	9,835	9,950			7,194	14,466	2,095
	78	79					

$$\text{Correlating: } r = \frac{\sum xy}{\sqrt{\sum x^2} \times \sqrt{\sum y^2}} = \frac{2,095}{\sqrt{7,194} \times \sqrt{14,466}}$$

$$r = \frac{2,095}{84.82 \times 120.2} = \frac{2,095}{10,195} = .2055$$

$$\text{P.E.}_r = \frac{.6745 \times (1-r^2)}{\sqrt{126}} = \frac{.6745 \times (1-.2055^2)}{\sqrt{126}} = \frac{.6745 \times (1-.4223)}{\sqrt{126}}$$

$$\text{P.E.}_r = \frac{.6745 \times .5777}{\sqrt{126}} = \frac{.3896}{\sqrt{126}} = \frac{.3896}{11.22} = .034$$

TABLE VIII (1934)

No.	X	Y	X	Y	X	Y
95	65	-13	-	4	159	55
96	65	7	6	4	49	55
97	75	-	-	4	9	15
98	75	-	-	4	9	15
99	75	-	-	4	9	15
100	75	-	-	4	9	15
101	65	-13	-	4	109	55
102	75	-	6	4	9	15
103	65	-13	6	4	109	55
104	75	-	-	4	9	15
105	75	-	-14	9	49	55
106	85	7	6	9	9	15
107	75	-	6	9	9	15
108	65	-13	6	9	109	55
109	65	7	6	9	49	55
110	75	-	6	9	9	15
111	85	7	-14	9	49	55
112	75	-	6	9	9	15
113	65	7	-	4	49	55
114	75	-	16	9	9	15
115	75	-	16	9	9	15
116	85	7	-	4	49	55
117	85	7	-	4	49	55
118	75	-	16	9	9	15
119	75	-	16	9	9	15
120	75	-	6	9	9	15
121	75	-	6	9	9	15
122	75	-	6	9	9	15
123	85	7	16	9	49	55
124	75	-	6	9	9	15
125	75	-	-29	9	9	15
126	75	-	6	9	9	15
127	9,855			7,194	14,400	5,035

$$\text{Correlation: } r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}} = \frac{14,400}{\sqrt{7,194 \times 9,855}} = .805$$

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}} = \frac{10,195}{\sqrt{5,035 \times 12,012}} = .805$$

$$P.E. r = \frac{.6745 \times (1-r^2)}{\sqrt{12}} = \frac{.6745 \times (1-.805^2)}{\sqrt{12}} = .6745 \times (1-.648) = .236$$

$$P.E. r = \frac{.6745 \times .577}{\sqrt{12}} = \frac{.388}{\sqrt{12}} = .112$$

Conclusions.

221.

Class	1938	1937	1936	1935	1934
Coefficient of Correlation	.485	.404	.352	.1501	.2055
Tests used	Alg.final H.S.average	Alg.final H.S.average	Alg.final H.S.average	Alg.final H.S.average	Alg.final H.S.average
Cases studied	227	336	279	194	126

A rather surprising coefficient of correlation is shown in the above tabulation. All values of r are positive and are high enough to show a definite positive relation.

Apparently the general scholastic average made by a student in his preparatory school work is as significant in predicting success or failure in college algebra as his high school algebra grade or his score on the Army Alpha. This is reasonable in view of the belief held by modern educators that failure in the study of any subject within a student's ability range is due to neglect and lack of interest or preparation rather than to a special disability in the subject. Insofar as any scholastic record shows the general ability of its maker, it serves to predict the success of the student in any kind of subject.

The high school average cannot be used to form ability sections in any course but it is of real significance when considered as a supplement to other measures.

As a matter of interest in this connection, ogives showing the frequencies of occurrence of the various values of algebra final grades and high school grades, plotted on the same sheet, are shown on pages 222, 223, 224, 225, and 226.

Conclusions.

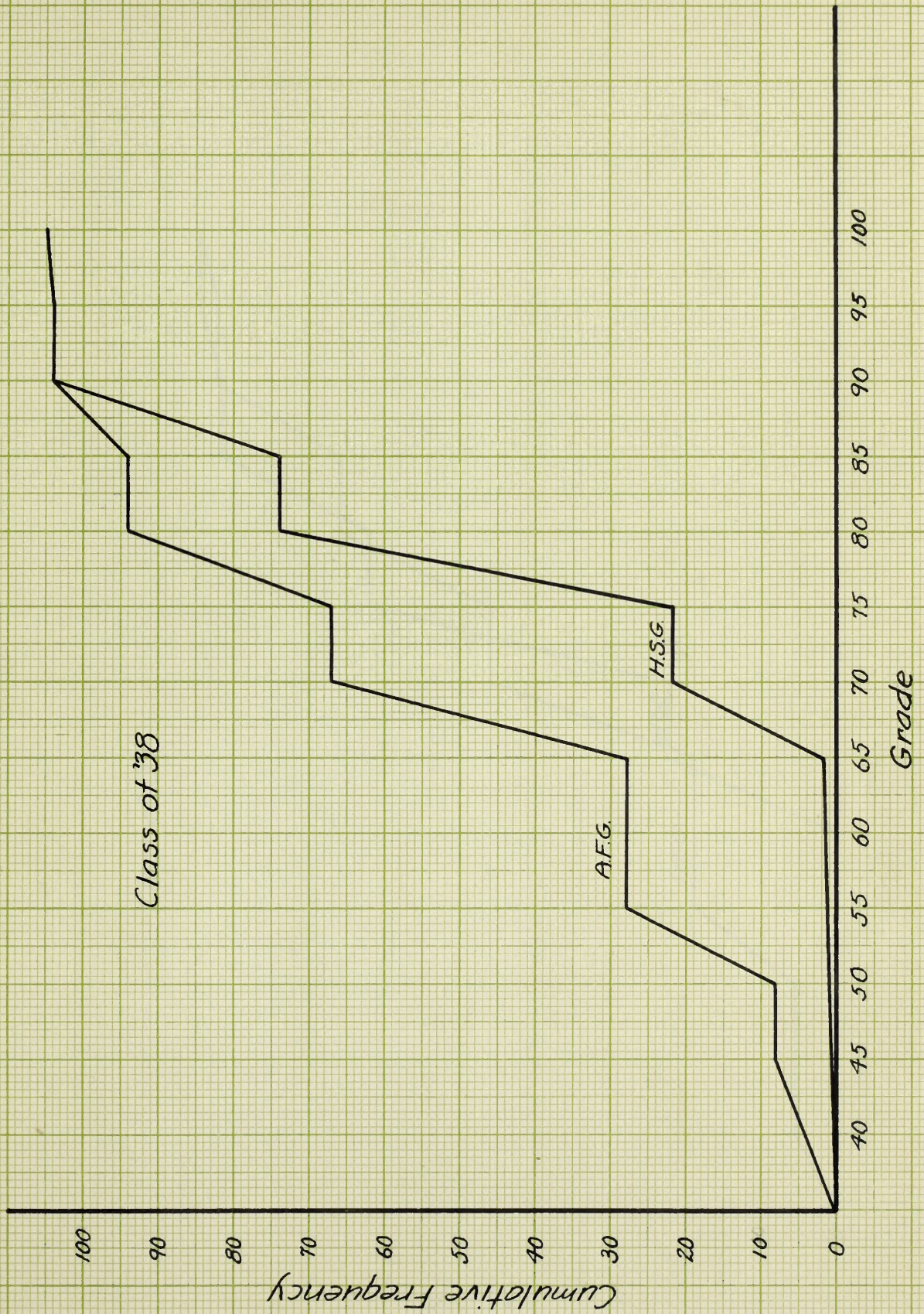
231.

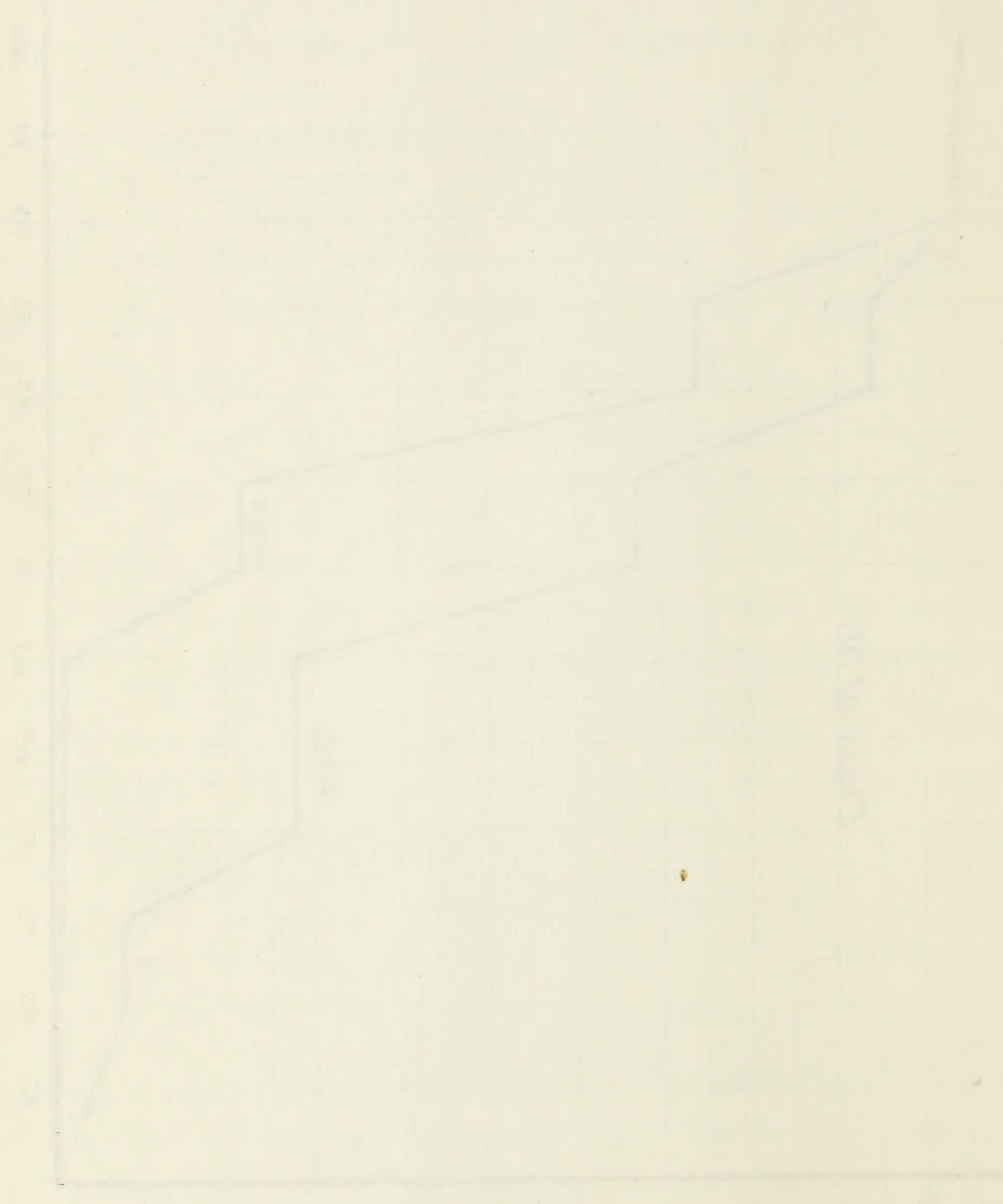
Class	1938	1937	1936	1935	1934
Coefficient of Correlation	.485	.404	.352	.1501	.3005
Tests used	Alg. Final A. Average	Alg. Final A. Average	Alg. Final A. Average	Alg. Final A. Average	Alg. Final A. Average
Cases studied	237	235	279	194	185

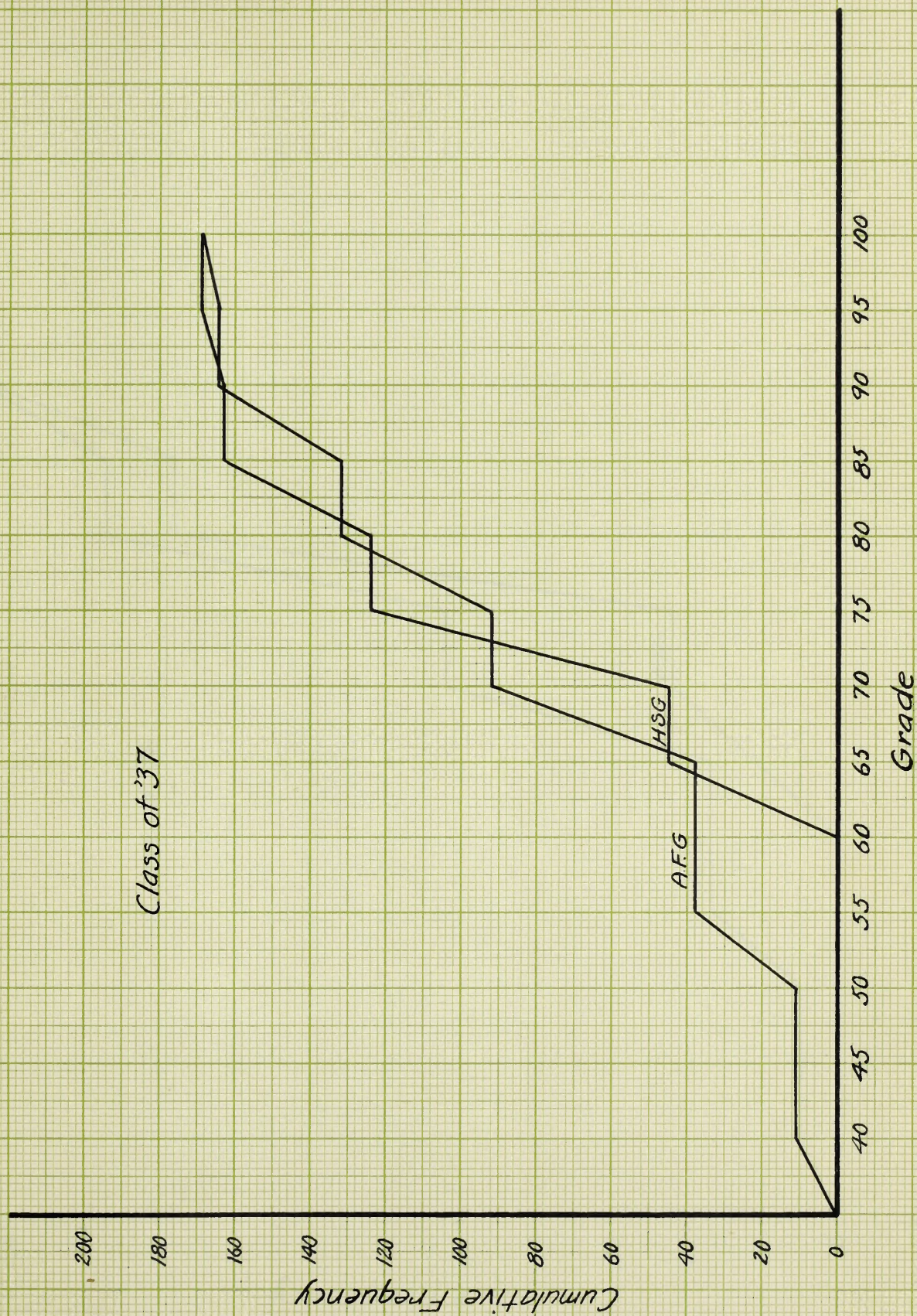
A rather surprising coefficient of correlation is shown in the above tabulation. All values of r are positive and are high enough to show a definite positive relation. Apparently the general scholastic average made by a student in his preparatory school work is as significant in predicting success or failure in college algebra as his high school algebra grade or his score on the Army Alpha. This is reasonable in view of the belief held by modern educators that failure in the study of any subject within a student's ability range is due to neglect and lack of interest or preparation rather than to a special disability in the subject. Insofar as any scholastic record shows the general ability of the maker, it serves to predict the success of the student in any kind of subject.

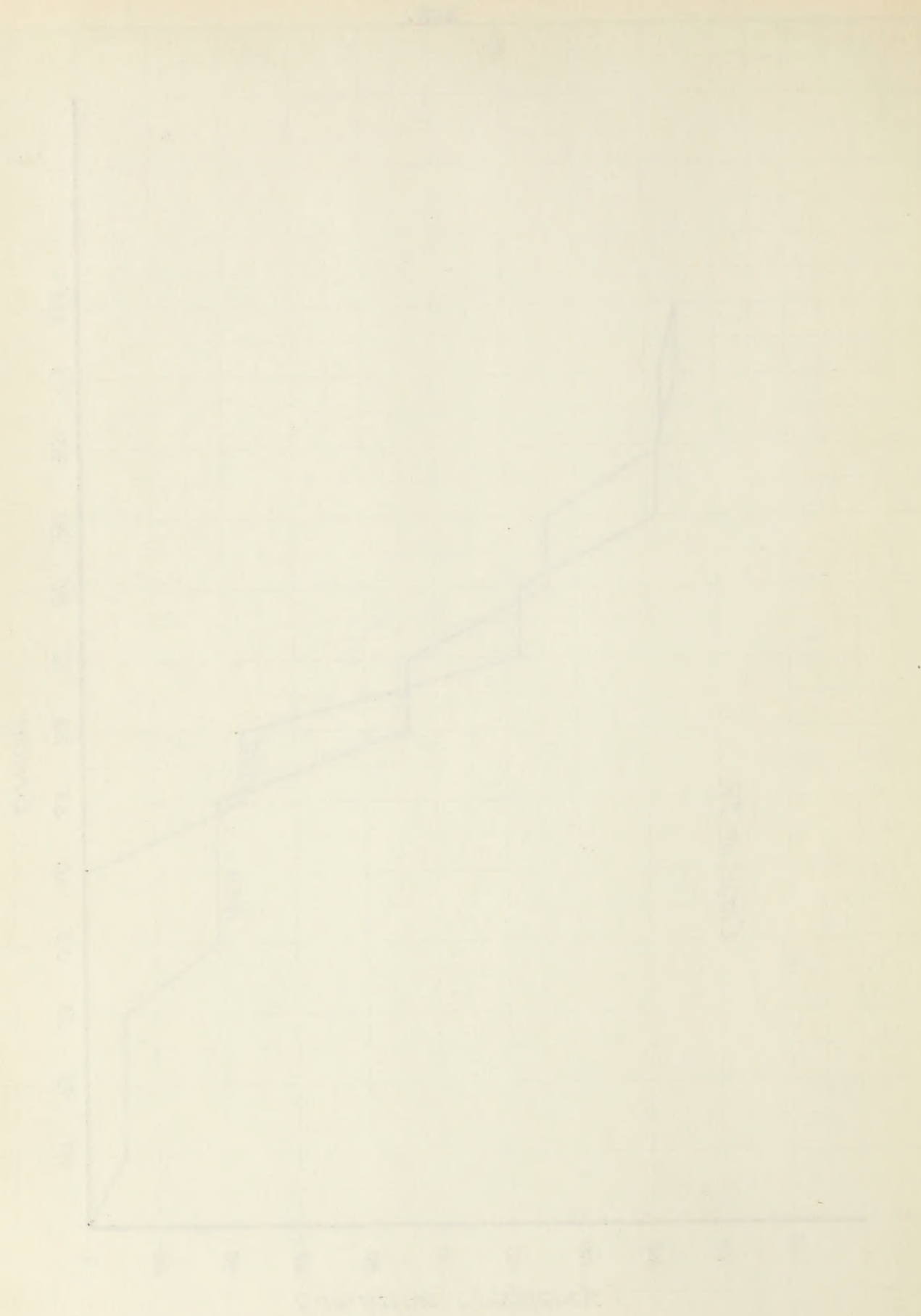
The high school average cannot be used to form ability sections in any course but it is of real significance when considered as a supplement to other measures.

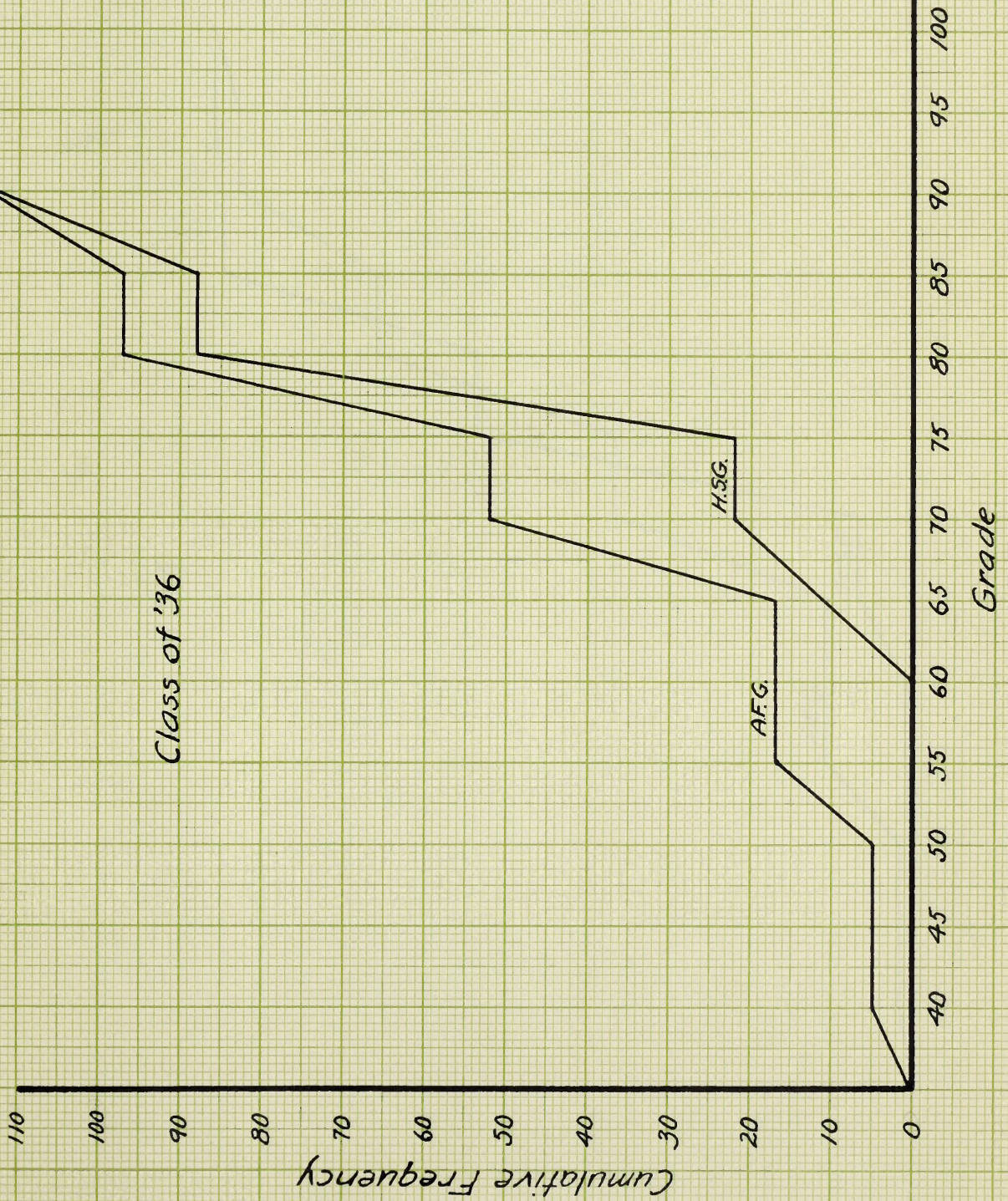
As a matter of interest in this connection, figures showing the frequencies of occurrence of the various values of algebra final grades and high school grades, plotted on the same sheet, are shown on pages 232, 233, 234, 235, and 236.

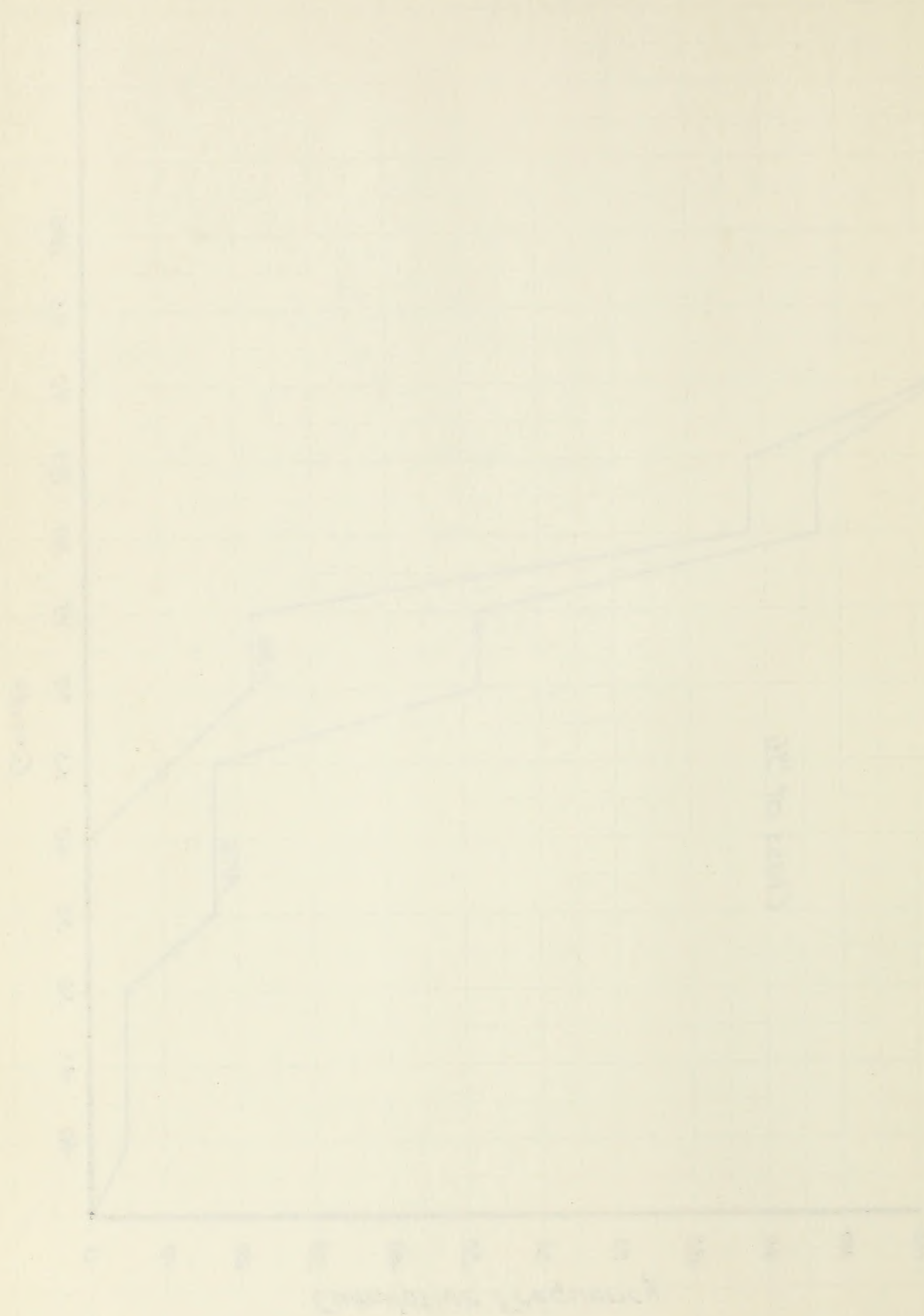


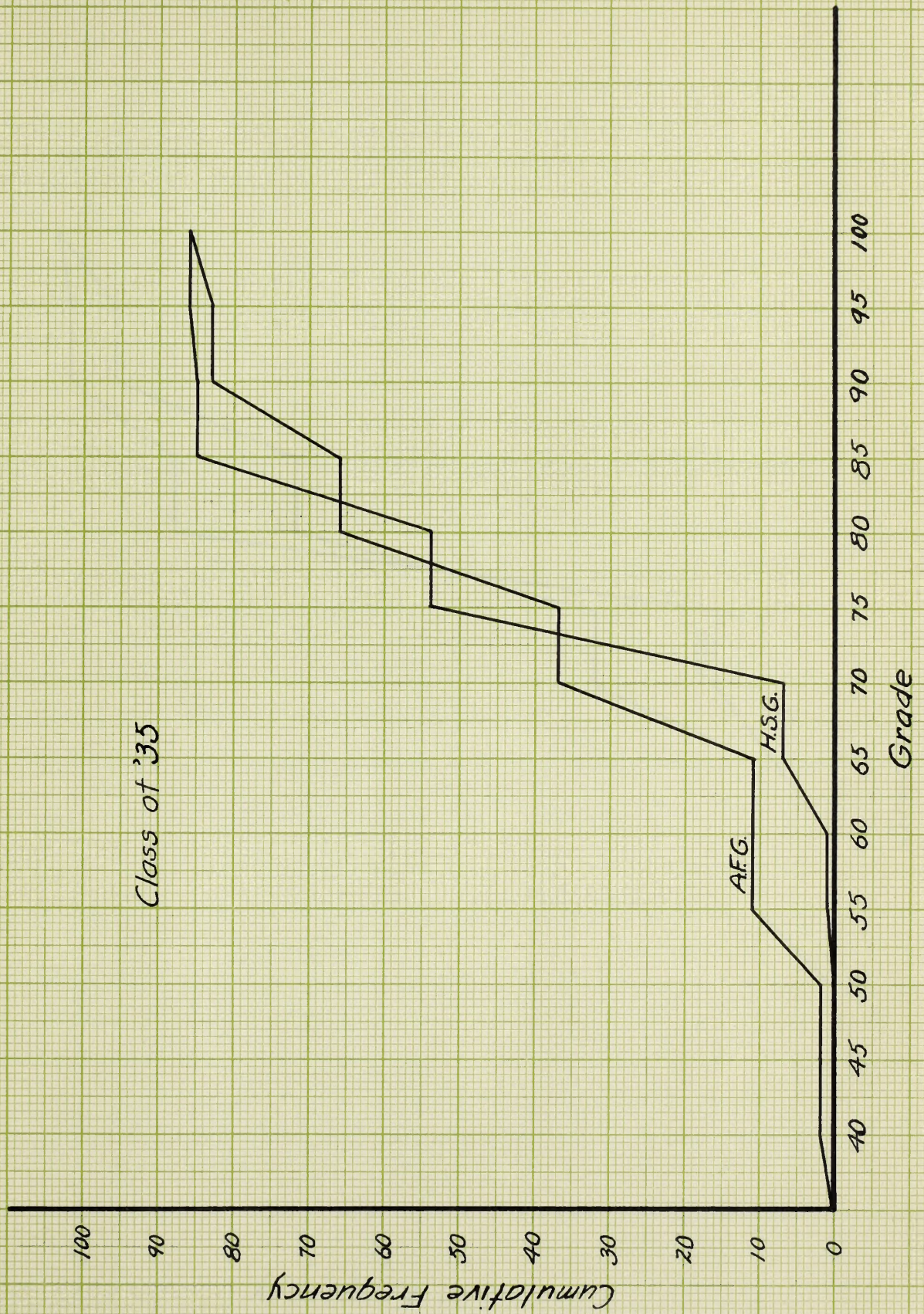


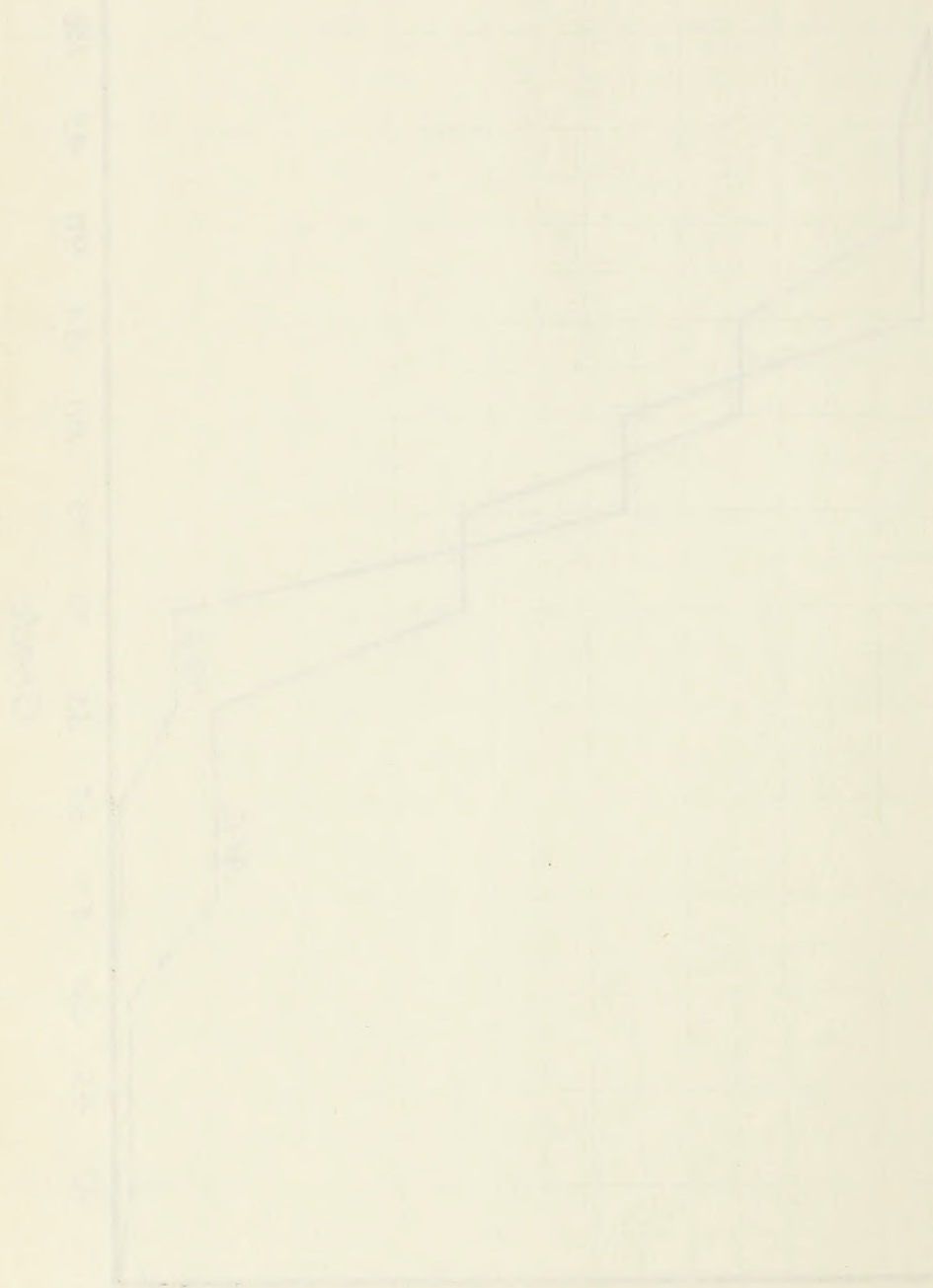


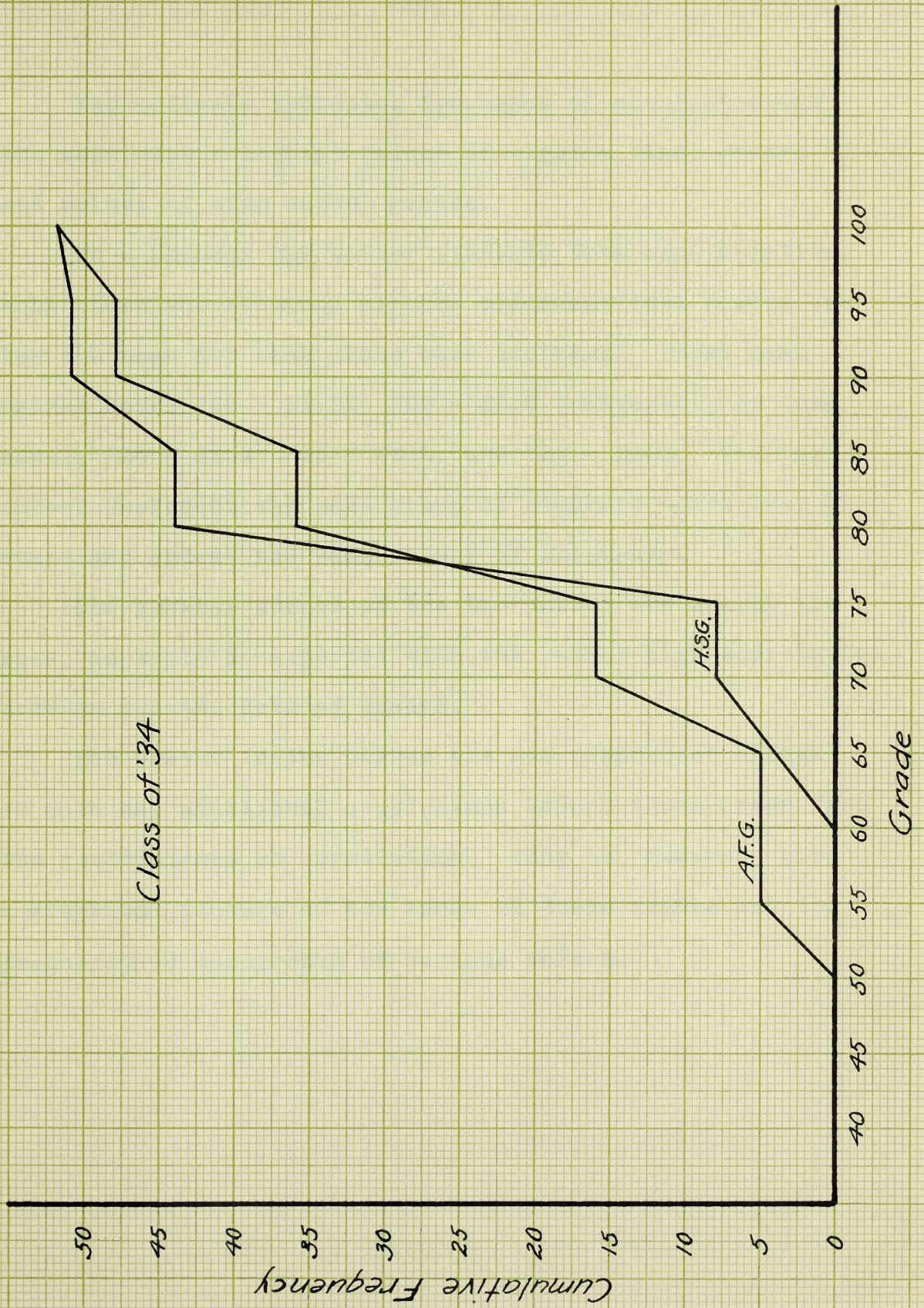


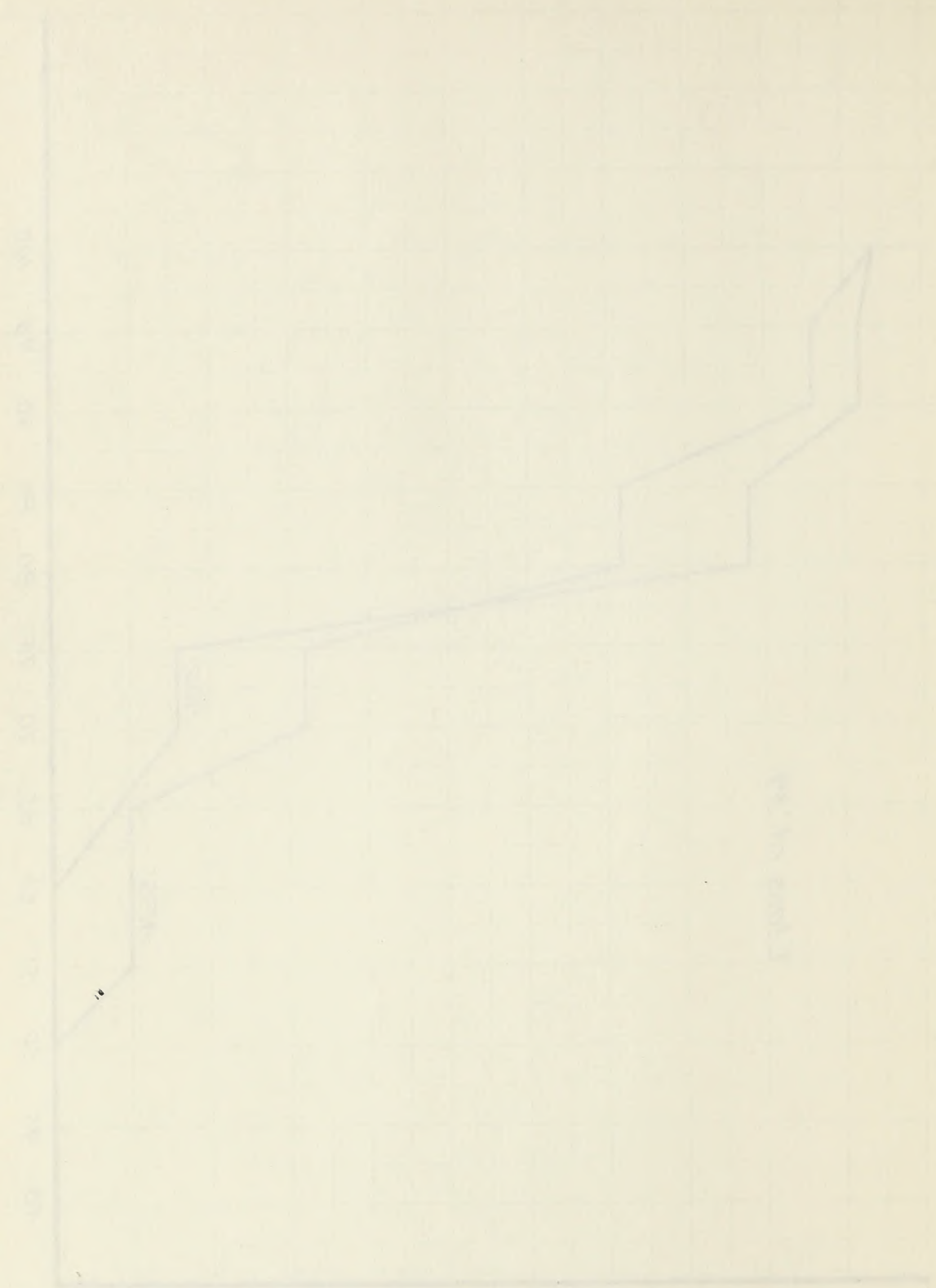












Graph of Volume vs. Temperature

The ordinate indicates frequency of occurrence and the abscissae represent values of algebra final grades and values of high school grades.

To eliminate the better students from consideration, only those who obtained algebra placement test scores below the mean for each class were included. These mean values were; '38 - 21.22, '37 - 35.5 (University of Iowa test), '36 - 22.4, '35 - 22.0, and '34 - 22.8. The two curves represent the same group of students hence they will start and end at the same values of frequency.

The general shapes of the two curves are nearly the same, as would be expected with the rather high correlation between the two sets of grades.

The breaks in the curves are not pronounced enough to show any additional conclusions beyond those drawn from the coefficients of correlation. They do, however, give a graphical picture of the range of these grades and the frequency of occurrence of various values.

The ordinate indicates frequency of occurrence and the abscissa represent values of algebra final grades and values of high school grades.

To eliminate the better students from consideration, only those who obtained algebra placement test scores below the mean for each class were included. These mean values were: '58 - 21.25, '59 - 25.5 (University of Iowa test), '60 - 22.4, '61 - 22.0, and '62 - 22.8. The two curves represent the same group of students hence they will start and end at the same values of frequency.

The general shapes of the two curves are nearly the same, as would be expected with the rather high correlation between the two sets of grades.

The breaks in the curves are not pronounced enough to show any additional conclusions beyond those drawn from the coefficients of correlation. They do, however, give a graphical picture of the range of these grades and the frequency of occurrence of various values.

Chapter VIII.RELATION OF HIGH SCHOOL ACHIEVEMENT TO PERSONALITY BALANCE
AS INDICATED BY BERNREUTER TEST B1-N.

In 1929, Prof. Thurstone at Chicago developed a test which was designed to investigate the personality of a subject and show the state of his or her mental health. This work was followed by several attempts of other authors and a good representative of this type of test suited to high school, college students and adults, is The Personality Inventory devised by Robert G. Bernreuter and published by the Stanford University Press, copyright 1931.

This Inventory consists of 125 questions about thoughts, emotions, and preferences which are to be answered "yes" or "no." It is self administering and requires about thirty minutes for completion. It can be scored in four different ways depending upon what aspect of personality it is desired to measure. These scorings and their features are:

B1-N. A measure of emotional stability. High positive scores tend to show emotional instability and negative scores show mental stability.

B2-S. A measure of self sufficiency. Persons getting high scores like to be alone while negative scores show a tendency to dislike solitude and seek companionship and advice.

B3-I. A measure of extroversion-introversion. High positive scores tend to show extreme introversion and a subject

Chapter VIII.

RELATION OF HIGH SCHOOL ACHIEVEMENT TO PERSONALITY BALANCEAS INDICATED BY BERKELEY TEST BI-N.

In 1922, Prof. Thurstone at Chicago developed a test which was designed to investigate the personality of a subject and show the state of his or her mental health. This work was followed by several attempts of other authors and a good representative of this type of test suited to high school, college students and adults, is the Personality Inventory devised by Robert G. Berkeley and published by the Stanford University Press, copyright 1931.

This Inventory consists of 144 questions about thoughts, emotions, and preferences which are to be answered "yes" or "no". It is self-administering and requires about thirty minutes for completion. It can be scored in four different ways depending upon what aspect of personality it is desired to measure. These scorings and their features are:

BI-N. A measure of emotional stability. High positive scores tend to show emotional instability and negative scores show mental stability.

BI-S. A measure of self-sufficiency. Persons getting high scores like to be alone while negative scores show a tendency to dislike solitude and seek companionship and advice.

BI-I. A measure of extraversion-introversion. High positive scores tend to show extreme introversion and a subject

getting 98 or higher on this or B1-N would probably benefit from psychiatric advice.

B4-D. A measure of dominance-submission. Persons scoring high tend to dominate in face to face situations. Low scores tend to show submissive traits.

The one test may be scored for all four results but three are usually used omitting either B1-N or B4-D.

All freshmen students in the class of '38 took this test and were scored on the B1-N basis.

The results of the four scorings for this test are comparable with the following four well known tests; Thurstone Neuretic Inventory (TN), the Bernreuter Self-sufficiency Test (SS), the Laird C2 Introversion Test (C-2), and the Allport Ascendance-Submission Reaction Study (AS).

In order to see if the high school scholastic record bears any relation to the state of emotional stability as indicated by the Bernreuter B1-N these two groups of data will be correlated for the class of '38. High school grades are used because at about the time when they are being obtained the youth is passing through the turbulent period of adolescence and is probably in his most unstable period.

The grades obtained on this test range from negative to positive values and to avoid the minus signs which would make the correlation more difficult, the scores will be assigned to an arbitrary scale where a 0 score is equivalent to 235. This makes all B1-N scores positive in sign but

getting 98 or higher on this or SI-N would probably benefit from psychiatric advice.

84-D. A measure of dominance-submission. Persons scoring high tend to dominate in face to face situations. Low scores tend to show submissive traits.

The one test may be scored for all four results but

three are usually used omitting either SI-N or 84-D.

All freshmen students in the class of '38 took this

test and were scored on the SI-N basis.

The results of the four scorings for this test are

comparable with the following four well known tests:

Thurstone Social Inventory (TI), the Barnet Self-

Confidence Test (SC), the Self-Confidence Test (C-S),

and the Allport Ascendance-Submission Reaction Study (AS).

In order to see if the high school scholastic record

bears any relation to the state of emotional stability as

indicated by the Barnet Self-Confidence Test (C-S) these two groups of data

will be correlated for the class of '38. High school grades

are used because at about the time when they are being ob-

tained the youth is passing through the turbulent period of

adolescence and is probably in his most unstable period.

The grades obtained on this test range from negative to

positive values and to avoid the minus signs which would

make the correlation more difficult, the scores will be

assigned to an arbitrary scale where a 0 score is equivalent

to 238. This makes all SI-N scores positive in sign but

TABLE LX * (1950)

will not affect the coefficient of correlation.

The following table contains all calculations for the value of r .

1	74	173	-1	-6.9	1	1540.41	48.9
2	75	154	-1	-13.9	1	47.81	8.9
3	76	154	-1	-13.9	1	153.81	13.9
4	77	194	-11	-58.9	121	2908.81	58.9
5	78	254	-11	58.9	121	3068.01	60.9
6	79	74	-11	-104.9	121	11427.81	1175.9
7	75	241	-1	111.1	1	12343.81	-111.1
8	76	130	-1	-41.9	1	1745.61	41.9
9	77	194	-11	-11.9	121	141.61	120.9
10	78	154	-11	-25.9	121	670.81	204.9
11	79	275	9	-4.9	81	34.81	-44.1
12	80	172	-11	-5.9	121	47.81	75.9
13	81	161	9	1.1	81	1.81	7.9
14	75	132	-1	-49.9	1	2490.81	49.9
15	76	222	-11	75.1	121	5640.01	-592.1
16	77	165	-1	-34.9	1	1218.01	34.9
17	78	129	9	-20.9	81	2040.81	-405.1
18	79	135	9	-44.9	81	2016.81	-404.1
19	75	173	-1	-6.9	1	47.81	8.9
20	76	154	-1	-13.9	1	670.81	25.9
21	77	170	-1	-9.9	1	98.81	-9.9
22	78	167	9	-13.9	81	165.81	-118.1
23	79	108	-1	-11.9	1	141.61	11.9
24	80	116	19	-64.9	361	4085.81	-1214.1
25	75	210	-1	30.1	1	906.01	-30.1
26	76	252	19	85.1	361	7242.81	1618.1
27	77	212	-1	58.1	1	1488.01	-58.1
28	78	74	-11	-104.9	121	10796.81	1148.9
29	79	127	9	-58.9	81	3468.81	-589.1
30	80	156	-11	-22.9	121	571.81	202.9
31	75	126	-1	-22.9	1	571.81	22.9
32	76	140	9	-24.9	81	1592.01	-259.1
33	77	127	-1	-58.9	1	2736.41	58.9
34	78	197	-1	17.1	1	292.41	-17.1
35	79	207	-1	27.1	1	734.41	-27.1
36	76	203	-1	29.1	1	789.61	-29.1
37	77	217	-1	37.1	1	1376.41	-37.1
38	78	222	9	38.1	81	2048.01	-487.9
39	79	199	9	-70.9	81	5026.81	-611.1
40	80	203	9	26.9	81	571.81	216.1
41	81	212	9	26.1	81	1502.81	224.9
42	75	122	-1	-47.9	1	2286.41	47.9
43	76	143	9	-23.9	81	1147.81	-215.1
44	77	206	-1	29.1	1	846.81	-29.1
45	78	169	-1	-20.9	1	714.81	20.9

will not affect the coefficient of correlation.
 The following table contains all calculations for
 the value of r .

TABLE IX a (1938)

Correlation of High School Average and Bernreuter
Personality Score

No.	X	Y	x	y	x ²	y ²	xy
1	75	137	- 1	- 42.9	1	1840.41	42.9
2	75	173	- 1	- 6.9	1	47.61	6.9
3	75	166	- 1	- 13.9	1	193.21	13.9
4	65	126	-11	- 53.9	121	2905.21	592.9
5	65	235	-11	55.1	121	3036.01	606.1
6	65	74	-11	-106.9	121	11427.61	1175.9
7	75	291	- 1	111.1	1	12343.21	- 111.1
8	75	138	- 1	- 41.9	1	1755.61	41.9
9	65	168	-11	- 11.9	121	141.61	130.9
10	65	154	-11	- 25.9	121	670.81	284.9
11	85	275	9	- 4.9	81	24.01	- 44.1
12	65	173	-11	- 6.9	121	47.61	75.9
13	85	181	9	1.1	81	1.21	9.9
14	75	130	- 1	- 49.9	1	2490.01	49.9
15	65	255	-11	75.1	121	5640.01	- 862.1
16	75	145	- 1	- 34.9	1	1218.01	34.9
17	85	129	9	- 50.9	81	2590.81	- 458.1
18	85	135	9	- 44.9	81	2016.01	- 404.1
19	75	173	- 1	- 6.9	1	47.61	6.9
20	75	154	- 1	- 25.9	1	670.81	25.9
21	75	170	- 1	- 9.9	1	98.01	9.9
22	85	167	9	- 12.9	81	166.41	- 116.1
23	75	168	- 1	- 11.9	1	141.61	11.9
24	95	116	19	- 63.9	361	4083.21	-1214.1
25	75	210	- 1	30.1	1	906.01	- 30.1
26	95	265	19	85.1	361	7242.01	1616.9
27	75	215	- 1	35.1	1	1232.01	- 35.1
28	65	76	-11	-103.9	121	10795.21	1142.9
29	85	117	9	- 62.9	81	3956.41	- 566.1
30	65	156	-11	- 23.9	121	571.21	262.9
31	75	156	- 1	- 23.9	1	571.21	23.9
32	85	140	9	- 39.9	81	1592.01	- 359.1
33	75	127	- 1	- 52.9	1	2798.41	59.9
34	75	197	- 1	17.1	1	292.41	- 17.1
35	75	207	- 1	27.1	1	734.41	- 27.1
36	75	208	- 1	28.1	1	789.61	- 28.1
37	75	217	- 1	37.1	1	1376.41	- 37.1
38	85	225	9	55.1	81	3036.01	- 459.9
39	85	109	9	- 70.9	81	5026.81	- 638.1
40	85	203	9	23.9	81	571.21	215.1
41	85	216	9	36.1	81	1303.21	324.9
42	75	132	- 1	- 47.9	1	2294.41	47.9
43	85	146	9	- 33.9	81	1149.21	- 315.1
44	75	206	- 1	26.1	1	681.21	- 26.1
45	75	169	- 1	- 30.9	1	954.81	30.9

TABLE 12 (1938)

Correlation of High School Average and Bernreuter Personality Score

No.	X	Y	X	Y	X	Y	X	Y
1	75	187	-	-	1	-	48.9	1840.41
2	75	173	-	-	1	-	47.61	18.41
3	75	166	-	-	1	-	113.21	12.21
4	65	186	-	-	11	-	130.81	12.81
5	65	235	-	-	11	-	1308.01	13.01
6	65	174	-	-	11	-	11427.61	11.427.61
7	75	221	-	-	1	-	12348.21	12.348.21
8	75	136	-	-	1	-	1738.61	17.38.61
9	65	166	-	-	11	-	141.61	14.1.61
10	65	164	-	-	11	-	270.81	27.0.81
11	85	275	9	-	9	-	24.01	24.01
12	65	173	-	-	11	-	47.61	47.61
13	85	181	9	-	9	-	1.21	1.21
14	75	130	-	-	1	-	2430.01	24.30.01
15	65	225	-	-	11	-	5640.01	56.40.01
16	75	145	-	-	1	-	1218.01	12.18.01
17	85	129	9	-	9	-	1290.81	12.90.81
18	85	135	9	-	9	-	1215.01	12.15.01
19	75	173	-	-	1	-	47.61	47.61
20	75	164	-	-	1	-	270.81	27.0.81
21	75	170	-	-	1	-	98.01	9.8.01
22	65	167	9	-	9	-	14.61	14.61
23	75	166	-	-	1	-	141.61	14.1.61
24	95	116	19	-	19	-	4083.21	40.83.21
25	75	210	-	-	1	-	308.01	30.8.01
26	95	265	19	-	19	-	7243.01	72.43.01
27	75	213	-	-	1	-	1223.01	12.23.01
28	65	75	-	-	11	-	10795.21	107.95.21
29	85	117	9	-	9	-	5366.41	53.66.41
30	65	166	-	-	11	-	571.21	57.1.21
31	75	166	-	-	1	-	571.21	57.1.21
32	85	140	9	-	9	-	1642.01	16.42.01
33	75	127	-	-	1	-	2748.41	27.48.41
34	75	127	-	-	1	-	2748.41	27.48.41
35	75	207	-	-	1	-	724.41	72.4.41
36	75	208	-	-	1	-	729.61	72.9.61
37	75	217	-	-	1	-	1270.41	12.70.41
38	85	225	9	-	9	-	3032.01	30.32.01
39	85	109	9	-	9	-	5082.81	50.82.81
40	85	203	9	-	9	-	271.21	27.1.21
41	85	215	9	-	9	-	1203.21	12.03.21
42	75	132	-	-	1	-	2244.41	22.44.41
43	85	145	9	-	9	-	1142.21	11.42.21
44	75	203	-	-	1	-	641.21	64.1.21
45	75	159	-	-	1	-	264.81	26.4.81

TABLE IX a (1938)

No.	X	Y	x	y	x ²	y ²	xy
46	85	305	9	125.1	81	15650.01	1125.9
47	75	195	- 1	15.1	1	228.01	- 15.1
48	75	104	- 1	- 75.9	1	5760.81	75.9
49	75	79	- 1	-100.9	1	10180.81	100.9
50	75	271	- 1	91.1	1	8299.21	- 91.1
51	85	264	9	84.1	81	7072.81	756.9
52	75	123	- 1	- 56.9	1	3237.61	56.9
53	75	175	- 1	- 24.9	1	620.01	24.9
54	85	239	9	59.1	81	3492.81	531.9
55	65	235	-11	55.1	121	3036.01	- 606.1
56	75	179	- 1	- 0.9	1	.81	0.9
57	65	85	-11	- 94.9	121	9006.01	1043.9
58	75	126	- 1	- 53.9	1	2905.01	53.9
59	85	316	9	130.1	81	16929.01	1170.9
60	75	82	-11	- 97.9	121	9584.41	1076.9
61	75	176	- 1	- 3.9	1	15.21	3.9
62	85	165	9	- 14.9	81	222.01	- 134.1
63	75	105	- 1	- 74.9	1	5610.01	74.9
64	65	127	-11	- 52.9	121	2798.41	581.9
65	85	179	9	- 0.9	81	.81	- 8.1
66	65	66	-11	-113.9	121	12973.21	1252.9
67	75	134	- 1	- 45.9	1	2106.81	45.9
68	75	115	- 1	- 64.9	1	4212.01	64.9
69	85	90	9	- 89.9	81	8082.01	- 809.1
70	85	237	9	57.1	81	3260.41	513.9
71	65	153	-11	- 26.9	121	723.61	295.9
72	75	82	- 1	- 97.9	1	9584.41	97.9
73	65	193	-11	13.1	121	171.61	- 144.1
74	85	300	9	120.1	81	14434.01	1010.9
75	65	312	-11	132.1	121	17450.41	-1453.1
76	75	96	- 1	- 83.9	1	7039.21	83.9
77	75	90	- 1	- 89.9	1	8082.01	89.9
78	85	247	9	67.1	81	4502.41	603.9
79	85	306	9	126.1	81	15901.21	1134.9
80	75	226	- 1	46.1	1	2125.21	- 46.1
81	75	88	- 1	- 91.9	1	8445.61	91.9
82	65	207	-11	27.1	121	734.41	- 298.1
83	75	87	- 1	- 92.9	1	8630.41	92.9
84	65	160	-11	- 19.9	121	396.01	218.9
85	65	128	-11	- 51.9	121	2693.61	570.9
86	75	503	- 1	323.1	1	104393.91	- 323.1
87	75	134	- 1	- 45.9	1	2106.81	45.9
88	75	177	- 1	- 2.9	1	8.41	2.9
89	75	183	- 1	3.1	1	9.61	- 3.1
90	85	147	9	- 32.9	81	1082.41	- 296.1
91	75	325	- 1	145.1	1	21084.01	- 145.1
92	75	167	-1	- 12.9	1	166.41	12.9
93	65	168	-11	- 11.9	121	141.61	130.9

TABLE IX A (1931)

No.	X	Y	Z	V	X	S	W
45	85	205	9	155.1	81	1550.01	1155.9
46	75	195	- 1	15.1	1	328.01	- 15.1
47	75	104	- 1	- 75.9	1	9780.81	75.9
48	75	79	- 1	- 100.9	1	10180.81	100.9
49	75	271	- 1	91.1	1	8239.81	- 91.1
50	85	254	9	84.1	81	7078.81	755.9
51	75	123	- 1	- 55.9	1	3237.81	55.9
52	75	175	- 1	- 24.9	1	820.01	24.9
53	85	239	9	53.1	81	3432.81	531.9
54	85	225	- 11	55.1	121	3036.01	- 505.1
55	75	179	- 1	- 0.9	1	.81	0.9
56	85	85	- 11	- 34.9	121	3008.01	1062.9
57	85	125	- 1	- 83.9	1	3205.01	52.9
58	85	216	9	120.1	81	14328.01	1170.9
59	75	85	- 11	- 27.9	121	3224.41	1076.9
60	75	175	- 1	- 3.9	1	12.81	3.9
61	75	175	- 1	- 14.9	81	322.01	- 134.1
62	85	195	9	- 74.9	1	810.01	74.9
63	75	105	- 1	- 55.9	121	2738.41	581.9
64	85	127	- 11	- 0.9	81	.81	8.1
65	85	179	9	- 113.9	121	1278.81	1228.9
66	85	85	- 11	- 45.9	1	2105.81	45.9
67	75	134	- 1	- 54.9	1	4212.01	54.9
68	75	112	- 1	- 84.9	81	8082.01	- 802.1
69	85	90	9	57.1	81	3290.41	513.9
70	85	237	9	- 25.9	121	723.81	235.9
71	85	122	- 11	- 27.9	1	2584.41	27.9
72	75	82	- 1	- 12.1	121	171.81	- 144.1
73	85	192	- 11	120.1	81	14434.01	1010.9
74	85	200	9	122.1	121	14450.41	- 1422.1
75	85	212	- 11	- 82.9	1	7029.81	82.9
76	75	95	- 1	- 89.9	1	8082.01	89.9
77	75	90	- 1	- 57.1	81	4802.41	502.9
78	85	247	9	125.1	81	15507.81	1124.9
79	85	205	9	45.1	1	2125.81	- 45.1
80	75	225	- 1	- 21.9	1	8445.81	21.9
81	75	88	- 11	- 27.1	121	724.41	- 222.1
82	75	87	- 1	- 22.9	1	830.41	22.9
83	85	120	- 11	- 19.9	121	325.01	215.9
84	85	128	- 11	- 51.9	121	2692.81	270.9
85	75	202	- 1	- 22.1	1	10422.21	- 222.1
86	75	124	- 1	- 45.9	1	2105.81	45.9
87	75	177	- 1	- 2.9	1	8.41	2.9
88	75	122	- 1	- 2.1	1	9.81	- 2.1
89	75	122	9	- 22.9	81	1022.41	- 222.1
90	85	127	- 1	- 145.1	1	21084.01	- 145.1
91	75	225	- 1	- 12.9	1	155.41	12.9
92	75	127	- 11	- 11.9	121	141.81	120.9
93	85	128	- 11	- 11.9	121	141.81	120.9

TABLE IX a (1938)

No.	X	Y	x	y	x ²	y ²	xy
94	75	182	- 1	2.1	1	4.41	- 2.1
95	75	155	- 1	- 24.9	1	620.01	24.9
96	65	172	-11	- 7.9	121	62.41	86.9
97	85	231	9	51.1	81	2611.21	459.9
98	75	134	- 1	- 45.9	1	2106.81	45.9
99	65	222	-11	42.1	121	1772.41	- 463.1
100	75	71	- 1	-108.9	1	11759.31	108.9
101	85	339	9	59.1	81	3492.81	531.9
102	65	196	-11	16.1	121	259.21	- 177.1
103	65	225	-11	45.1	121	2034.01	- 496.1
104	65	198	-11	18.1	121	327.61	- 199.1
105	65	122	9	57.9	81	3352.41	521.1
106	65	126	-11	- 53.9	121	2905.21	592.9
107	75	189	- 1	9.1	1	82.81	- 9.1
108	75	146	- 1	- 33.9	1	1149.21	33.9
109	75	212	- 1	32.1	1	1030.41	- 32.1
110	75	76	- 1	-103.9	1	10795.21	103.9
111	75	104	- 1	- 75.9	1	5760.81	75.9
112	65	227	-11	47.1	121	2218.41	- 518.1
113	85	75	9	-104.9	81	11004.01	- 944.1
114	85	225	9	75.1	81	5640.01	675.9
115	85	123	-11	- 56.9	121	3237.61	625.9
116	65	181	-11	1.1	121	1.21	- 12.1
117	85	238	9	58.1	81	3373.61	522.9
118	85	241	9	61.1	81	3733.21	529.9
119	85	68	9	-111.9	81	12521.61	-1007.1
120	65	169	-11	- 10.9	121	118.81	119.9
121	75	247	- 1	67.1	1	4502.21	- 67.1
122	75	165	- 1	- 14.9	1	222.01	14.9
123	65	197	-11	17.1	121	292.41	- 188.1
124	85	198	9	18.1	81	327.61	162.9
125	85	98	9	- 81.9	81	6707.61	- 737.1
126	75	157	- 1	- 22.9	1	524.41	22.9
127	75	110	- 1	- 69.9	1	4886.01	69.9
128	95	191	19	11.1	361	123.21	210.9
129	75	221	- 1	41.1	1	1689.21	- 41.1
130	75	234	- 1	54.1	1	2926.81	- 54.1
131	75	162	- 1	- 17.9	1	320.41	17.9
132	75	152	- 1	- 27.9	1	778.41	27.9
133	85	217	9	37.1	81	1376.41	623.9
134	75	268	- 1	88.1	1	7761.61	- 88.1
135	85	262	9	82.1	81	6740.41	746.1
136	75	335	-1	155.1	1	24256.01	- 155.1
137	75	105	- 1	- 74.9	1	5610.09	74.9
138	75	104	- 1	- 75.9	1	5760.81	75.9
139	65	201	-11	21.1	121	445.21	- 232.1
140	85	111	9	- 68.9	81	4747.21	- 620.1

TABLE IX a (1958)

No.	X	Y	X	Y	X	Y	X
94	75	181	1	-	1	-	1.8
95	75	182	1	-	1	-	8.4
96	55	173	-11	-	1	-	8.8
97	85	231	9	-	1	-	9.9
98	75	134	1	-	1	-	4.3
99	55	222	-11	-	1	-	1.3
100	75	71	1	-	1	-	10.8
101	55	229	9	-	1	-	9.1
102	55	195	-11	-	1	-	1.7
103	55	222	-11	-	1	-	1.3
104	55	198	-11	-	1	-	1.9
105	55	122	9	-	1	-	1.1
106	55	122	-11	-	1	-	9.8
107	75	189	1	-	1	-	2.1
108	75	146	1	-	1	-	9.3
109	75	212	1	-	1	-	1.2
110	75	75	1	-	1	-	10.3
111	75	104	1	-	1	-	7.9
112	55	227	-11	-	1	-	51.1
113	55	75	9	-	1	-	94.1
114	55	225	9	-	1	-	67.9
115	55	123	-11	-	1	-	22.9
116	55	181	-11	-	1	-	12.1
117	55	222	9	-	1	-	22.9
118	55	241	9	-	1	-	22.9
119	55	55	9	-	1	-	10.7
120	55	199	-11	-	1	-	11.9
121	75	247	1	-	1	-	1.7
122	75	165	1	-	1	-	1.4
123	55	197	-11	-	1	-	1.9
124	55	198	9	-	1	-	1.3
125	55	98	9	-	1	-	1.7
126	75	197	1	-	1	-	8.9
127	75	110	1	-	1	-	8.9
128	55	191	19	-	1	-	81.9
129	75	221	1	-	1	-	41.1
130	75	224	1	-	1	-	54.1
131	75	122	1	-	1	-	17.9
132	75	122	1	-	1	-	27.9
133	55	217	9	-	1	-	82.9
134	75	222	1	-	1	-	8.1
135	55	222	9	-	1	-	74.1
136	75	222	1	-	1	-	13.1
137	75	105	1	-	1	-	7.9
138	75	104	1	-	1	-	7.9
139	55	201	-11	-	1	-	22.1
140	55	111	9	-	1	-	20.1

TABLE IX a (1938)

No.	X	Y	x	y	x ²	y ²	xy
141	75	126	- 1	- 53.9	1	2905.21	53.9
142	85	217	9	37.1	81	1376.41	333.9
143	65	205	- 11	25.1	121	630.01	- 276.1
144	75	66	- 1	-113.9	1	12973.21	113.9
145	85	177	9	- 2.9	81	8.41	- 26.1
146	75	263	- 1	83.1	1	6905.61	- 83.1
147	85	337	9	157.1	81	26720.41	1413.9
148	75	222	- 1	42.1	1	1772.41	- 42.1
149	85	144	9	- 35.9	81	1288.81	- 323.1
150	75	249	- 1	69.1	1	4774.81	- 69.1
151	95	213	19	33.1	361	1095.61	628.9
152	65	176	-11	- 3.9	121	15.21	42.9
153	85	202	9	22.1	81	488.41	198.9
154	75	63	- 1	-116.9	1	13665.61	116.9
155	85	133	9	- 46.9	81	2199.61	- 522.1
156	65	70	-11	-109.9	121	12078.01	1208.9
157	85	207	9	27.1	81	734.41	- 243.9
158	75	376	- 1	196.1	1	35455.21	- 196.1
159	75	282	- 1	102.1	1	10424.41	- 102.1
160	85	83	9	- 96.9	81	9235.21	- 872.1
161	75	279	- 1	99.1	1	9820.81	- 99.1
162	75	210	- 1	30.1	1	906.01	- 30.1
163	75	96	- 1	- 83.9	1	7039.21	83.9
164	75	129	- 1	- 50.9	1	2590.81	50.9
165	85	213	9	33.1	81	1095.61	2297.9
166	75	263	- 1	83.1	1	6905.61	- 83.1
167	75	206	- 1	26.1	1	681.21	- 26.1
168	65	204	-11	24.1	121	580.81	- 265.1
169	65	157	-11	- 22.9	121	524.41	251.9
170	75	165	- 1	- 14.9	1	222.01	14.9
171	75	165	- 1	- 14.9	1	222.01	14.9
172	65	241	-11	66.1	121	4369.21	- 327.1
173	75	140	- 1	-39.9	1	1592.01	39.9
174	75	179	- 1	- 0.9	1	.81	0.9
175	75	273	- 1	93.1	1	8667.61	- 93.1
176	75	195	- 1	- 15.9	1	252.81	15.9
177	75	265	- 1	85.1	1	7242.01	- 85.1
178	75	124	- 1	- 55.9	1	3124.81	55.9
179	85	158	9	- 21.9	81	479.61	- 197.1
180	65	208	-11	28.1	121	789.61	- 309.1
181	75	119	- 1	- 60.9	1	3708.81	60.9
182	75	257	- 1	77.1	1	5944.41	- 77.1
183	75	37	- 1	-142.9	1	20420.41	142.9
184	75	224	- 1	44.1	1	1944.81	- 44.1
185	85	287	9	107.1	81	11470.41	963.9
186	75	178	- 1	- 1.9	1	3.61	1.9
187	85	235	9	55.1	81	3036.01	4495.9
188	75	272	- 1	92.1	1	8482.41	- 92.1

TABLE 12 (1958)

No.	X	Y	X	Y	X	Y	X
188	75	272	1	22.1	81	202.0	1.21
189	85	235	9	1.9	81	202.0	1.21
190	65	208	-11	22.1	181	320.8	1.21
191	75	266	1	-113.9	1	18273.81	1.21
192	85	177	9	2.9	81	8.41	1.21
193	75	262	1	82.1	1	6905.61	1.21
194	85	237	9	127.1	81	10370.41	1.21
195	75	232	1	42.1	1	1772.41	1.21
196	85	144	9	-22.9	81	1222.81	1.21
197	75	249	1	62.1	1	4744.81	1.21
198	95	215	19	22.1	361	1096.61	1.21
199	65	175	-11	2.9	121	15.81	1.21
200	85	202	9	22.1	81	488.41	1.21
201	75	62	1	-113.9	1	13865.61	1.21
202	85	122	9	-42.9	81	2199.61	1.21
203	65	70	-11	-102.9	121	12078.01	1.21
204	85	207	9	27.1	81	734.41	1.21
205	75	276	1	122.1	1	2930.21	1.21
206	75	222	1	102.1	1	10424.41	1.21
207	85	82	9	-22.9	81	622.81	1.21
208	75	272	1	22.1	1	220.01	1.21
209	75	210	1	20.1	1	400.01	1.21
210	75	22	1	-22.9	1	519.21	1.21
211	75	122	1	-20.9	1	436.81	1.21
212	85	212	9	22.1	81	1026.61	1.21
213	75	222	1	22.1	1	488.41	1.21
214	75	202	1	22.1	1	488.41	1.21
215	75	204	-11	24.1	121	296.41	1.21
216	65	127	-11	-22.9	121	222.01	1.21
217	75	122	1	-14.9	1	222.01	1.21
218	75	122	1	-14.9	1	222.01	1.21
219	65	241	-11	22.1	121	1482.81	1.21
220	75	140	1	-22.9	1	519.21	1.21
221	75	172	1	0.9	1	0.81	1.21
222	75	272	1	22.1	1	488.41	1.21
223	75	122	1	-12.9	1	166.41	1.21
224	75	222	1	22.1	1	488.41	1.21
225	75	124	1	-22.9	1	519.21	1.21
226	85	122	9	-22.9	81	474.41	1.21
227	65	208	-11	22.1	121	1482.81	1.21
228	75	112	1	-20.9	1	436.81	1.21
229	75	227	1	77.1	1	5944.41	1.21
230	75	27	1	-142.9	1	20420.41	1.21
231	75	224	1	44.1	1	1944.81	1.21
232	85	227	9	107.1	81	11470.41	1.21
233	75	172	1	1.9	1	3.61	1.21
234	85	222	9	22.1	81	202.0	1.21
235	75	272	1	22.1	1	488.41	1.21

TABLE IX a (1938)

No.	X	Y	x	y	x ²	y ²	xy
189	95	313	19	133.1	361	17715.61	2528.9
190	75	128	- 1	- 51.9	1	2693.61	51.9
191	65	271	-11	91.1	121	8299.21	-1001.1
192	85	173	9	- 6.9	81	47.61	- 62.1
193	75	207	- 1	27.1	1	734.41	- 27.1
194	65	258	-11	78.1	121	6099.61	- 859.1
195	75	168	- 1	- 11.9	1	141.61	11.9
196	85	210	9	30.1	81	906.01	270.9
197	65	247	-11	67.1	121	4502.41	- 738.1
198	75	3	- 1	-176.9	1	31293.61	176.9
199	65	228	-11	48.1	121	2313.61	- 529.1
200	75	182	-11	2.1	121	4.41	- 23.1
201	85	192	9	12.1	81	146.41	108.9
202	85	194	9	14.1	81	198.81	126.9
203	85	256	9	76.1	81	5791.21	684.9
204	85	197	9	17.1	81	292.41	153.9
205	75	302	- 1	122.1	1	14908.41	- 122.1
206	85	304	9	124.1	81	15400.81	1116.9
207	65	239	-11	59.1	121	3492.81	- 650.1
208	75	190	- 1	10.1	1	102.01	- 10.1
209	75	140	- 1	- 39.9	1	1592.01	39.9
210	95	91	9	- 88.9	81	7903.21	-800.1
211	65	200	-11	20.1	121	4041.01	- 221.1
212	75	179	- 1	- 0.9	1	.81	0.9
213	75	74	- 1	-105.9	1	11214.81	105.9
214	75	33	- 1	-146.9	1	21578.61	146.9
215	65	96	-11	- 83.9	121	7039.21	922.9
216	75	97	- 1	- 82.9	1	6872.41	82.9
217	85	139	9	- 40.9	81	1672.81	- 368.1
218	85	154	9	- 25.9	81	670.81	- 215.1
219	75	106	- 1	- 73.9	1	5461.21	73.9
220	65	97	-11	- 82.9	121	6872.41	911.9
221	85	374	9	194.1	81	37754.81	1746.9
222	85	74	9	-105.9	81	11199.81	- 953.1
223	75	157	- 1	- 22.9	1	524.41	22.9
224	65	110	-11	- 69.9	121	4886.01	768.9
225	65	200	-11	20.1	121	404.01	- 221.1
226	65	284	-11	104.1	121	10836.81	-1145.1
227	65	105	-11	- 74.9	121	5610.01	823.9
228	65	133	-11	- 46.9	121	2199.61	515.9
229	95	138	19	- 41.9	361	1755.61	- 796.1
230	65	69	-11	-110.9	121	12298.81	1219.9
231	85	77	9	-102.9	81	10588.41	- 926.1
232	75	97	- 1	- 82.9	1	6872.41	82.9
233	85	253	9	73.1	81	5343.61	657.9
234	65	221	-11	41.1	121	1689.21	- 452.1
235	65	326	-11	146.1	121	21345.21	-1607.1
236	75	178	- 1	- 1.9	1	3.61	1.9

TABLE 1A 2 (1938)

No.	1	Y	X	V	X	Y	X
188	98	218	19	132.1	261	17715.61	2822.9
189	75	138	- 1	- 51.9	1	18.222.61	21.9
191	65	271	-11	91.1	181	8222.81	-1001.1
192	85	173	9	- 6.9	81	47.61	- 1.32
193	75	207	- 1	27.1	1	724.41	- 27.1
194	65	258	-11	78.1	181	6022.61	- 822.1
195	75	168	- 1	- 11.9	1	141.61	11.9
196	65	210	9	30.1	81	906.01	270.9
197	65	247	-11	67.1	181	4502.41	- 722.1
198	75	3	- 1	-178.9	1	3122.81	178.9
199	65	229	-11	48.1	181	2312.61	- 222.1
200	75	182	-11	2.1	181	4.41	- 22.1
201	65	192	9	12.1	81	146.41	102.9
202	65	194	9	14.1	81	196.81	122.9
203	65	226	9	78.1	81	6091.21	222.9
204	65	197	9	17.1	81	292.41	122.9
205	75	202	- 1	122.1	1	14908.41	- 122.1
206	65	204	9	124.1	81	15400.81	112.9
207	65	229	-11	62.1	181	3842.81	- 222.1
208	75	190	- 1	10.1	1	102.01	- 10.1
209	75	140	- 1	- 22.9	1	122.01	22.9
210	65	21	9	- 88.9	81	7922.21	- 802.1
211	65	200	-11	20.1	181	404.01	- 221.1
212	75	172	- 1	- 0.9	1	81	0.9
213	75	74	- 1	-106.9	1	11214.81	106.9
214	75	22	- 1	-146.9	1	21578.61	146.9
215	65	26	-11	- 82.9	181	7022.21	222.9
216	75	27	- 1	- 82.9	1	6872.41	82.9
217	65	122	9	- 40.9	81	1672.81	- 222.1
218	65	124	9	- 26.9	81	670.81	- 216.1
219	75	106	- 1	- 72.9	1	5221.21	72.9
220	65	27	-11	- 82.9	181	6872.41	217.9
221	65	174	9	124.1	81	15394.81	1742.9
222	65	74	9	-102.9	81	11122.81	- 222.1
223	75	127	- 1	- 22.9	1	522.41	22.9
224	65	110	-11	- 62.9	181	4222.01	222.9
225	65	220	-11	20.1	181	404.01	- 221.1
226	65	284	-11	104.1	181	10822.81	-1121.1
227	65	108	-11	- 74.9	181	5510.01	222.9
228	65	122	-11	- 48.9	181	2122.61	212.9
229	65	122	19	- 41.9	261	1722.61	- 222.1
230	65	22	-11	-110.9	181	12222.81	1212.9
231	65	77	9	-102.9	81	10222.41	- 222.1
232	75	27	- 1	- 82.9	1	6872.41	82.9
233	65	222	9	72.1	81	5222.61	222.9
234	65	221	-11	41.1	181	1692.81	- 222.1
235	65	222	-11	142.1	181	2022.21	-1222.1
236	75	176	- 1	- 1.9	1	2.61	1.9

TABLE IX a (1938)

No.	X	Y	x	y	x ²	y ²	xy
237	75	98	- 1	- 81.9	1	6707.61	81.9
238	75	300	- 1	120.1	1	13424.01	- 120.1
239	75	279	- 1	- 0.9	1	.81	0.9
239	43020				14279.0	1235311.79	16695.09

76 179.9

0 = 235

Correlating :

$$r = \frac{\sum xy}{\sqrt{\sum x^2} \times \sqrt{\sum y^2}} = \frac{16,695.09}{\sqrt{14,279} \times \sqrt{1,235,311.79}}$$

$$r = \frac{16,695.09}{119.5 \times 1111.40} = \frac{16,695.09}{132,812.30}$$

$$r = 0.125$$

TABLE 11 (1938)

Y	X	Y	X	Y	X	Y	X
8.18	18.7075	1	8.18	1	88	75	837
1.031	10.8221	1	1.031	1	800	75	838
0.9	18.	1	0.9	1	875	75	839
10.8221	18.7075	1	10.8221	1	800	75	838

Y = 19.9
X = 0

Correlation:

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}} = \frac{18.925.03}{\sqrt{14.878 \times 1,325,11.49}} = 0.123$$

CONCLUSIONS.

The coefficient value of 0.125 obtained from the preceding calculation does not indicate any significant relation.

This result is substantiated by experience in life where emotional stability is seldom coupled with either the maximum amount, or quality, of work. In fact, many persons of only average ability and with great emotional instability, by bringing into play compensation and other less obvious mechanisms, achieve a very fair degree of success in life. Others of superior attainment show flashes of extreme creative ability between outbursts of something near kin to insanity. On the other hand, a person with extreme emotional stability may often be so stolid and dull minded that while he may be perfect from a statistical point of view he is of no use to humanity from a creative standpoint.

Experience shows that while many students getting a high Bl-N score fail to experience particular difficulty, all cases needing psychiatric treatment show very high scores.

This test is evidently rather useful in pointing out the existence of an undesirable but dormant tendency which may or may not develop, depending upon the experiences of the person concerned. It is also valuable to supplement and confirm a diagnosis made on some other basis. It is

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of no use in predicting performance in mathematics or other subjects and should not be so used. All test results which purport to indicate a person's probable behavior or success by measure of his emotions or preferences must be used with caution and only considered significant when their conclusions are supported by other indicators.

In this connection, Frank M. Freeman has said, "Tests in the field of non-intellectual attitude and functions are still chiefly in the realm of experimental development. A few of them are well enough worked out to be tried tentatively in the field of practical application. The interpretation of their results, however, should be made with great caution. Enough has been done to indicate that we may be able ultimately to test the non-intellectual functions as well as we now can test the intellectual ones."

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Chapter IX.SUMMARY AND RECOMMENDATIONS.

In the summary of this paper an attempt will be made to give in condensed form for reference the conclusions which have been drawn in the preceding chapters together with recommendations as to the respective value of the various tests considered. Only the conclusions and recommendations will be included here and the reasoning used in arriving at each conclusion may be found by reference to the particular chapter where the calculation was carried out. The various tests will be considered here in the same relative order as they were taken up in the body of the thesis.

Algebra Placement Test.

The average correlation coefficient of the placement test with the college algebra final grades is + 0.6038. The test should be retained as used at present and its use further extended whenever it is deemed advisable to form algebra ability sections. It is recommended that ability sectioning be carried out whenever the size of the class permits.

All cases of a placement score of less than 20 should be segregated and a study made of the corresponding Army Alpha scores. The men in this group who have an Army Alpha

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rating of above the mean of the group may be excused from the lowest ability section but should be placed as far down the scale of sections as is possible, taking into consideration the number of possible subdivisions and the relative number of low placement score cases.

After five weeks of school a study should be made of all grades in the class and any obvious mis-fits moved to what appears to be their proper ability section.

A definite effort should be made to motivate the sections properly, especially those in the lower ranges. The lower sections should be handled as opportunity groups rather than penalty groups. With proper instructional material and technique the motivation should take care of itself in the higher ability sections.

Army Alpha Test.

The Well's revision of the Army Alpha test should be administered to all entering freshmen whether they expect to enter engineering or business administration. Results of this test should be used in advisory work to supplement the advisor's judgment and information obtained from the student's grades. It should be used also as an aid to sectioning as was mentioned previously.

The normal probability curve is useful as a guide in checking over the distribution of grades in a class to see if an excessive number of grades of a particular value

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exist without apparent reason. If such is found to be the case the cause should be ferreted out and constructive steps taken to deal with the situation. In no case should the curve be followed blindly in awarding individual grades unless the group is very large, 300 or more, and unless the material on which the grade is based is diversified and of considerable quantity.

Army Alpha Arithmetic Section.

Scores on the mathematical section of the Army Alpha, called "arithmetic section" in this paper even though it contains some problems requiring the use of algebra, have little relation to the college algebra final grades. Hence scores on this section of the test will be disregarded except for their part in determining the total Army Alpha score.

Relation of Army Alpha Scores to High School Average.

There is a slight positive relation between the total high school average and the Army Alpha score found upon entrance to college. The relation is so slight that it is not significant for the present purpose and will be dropped from further consideration.

High School Algebra Grades vs. College Algebra Grades.

For the five years considered the average correlation of these sets of data is $+ 0.322$. This value signifies that a real relation exists. It is, however, appreciably lower than the value of r obtained by correlating the place-

exist without apparent reason. If such is found to be the case the cause should be ferreted out and corrective steps taken to deal with the situation. In no case should the curve be followed blindly in awarding individual grades unless the group is very large, 500 or more, and unless the material on which the grade is based is diversified and of considerable quantity.

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High School Algebra Grades vs. College Algebra Grades.

For the five years considered the average correlation of these sets of data is + 0.328. This value signifies that a real relation exists. It is, however, appreciably lower than the value of 1 obtained by correlating the place-

ment test scores and the college algebra grades. The significance of the high school algebra grades should be kept in mind as they would be useful in the absence of other measures.

With a reasonably accurate placement available they should not be used except for determining admission requirements and individual eligibility.

High School Scholastic Average vs. College Algebra Grades.

The average value of correlation for the above grades over a five year period is + 0.3199, again indicating a real, but not high, positive relation. This correlation is somewhat lower than the correlation of the algebra placement test with the algebra final grades. It is, however, practically the same as the relation of the high school algebra grades to the college algebra grades. There is evidently no difference between the worth of the high school algebra grades and the total high school scholastic average for predicting how the student will fare in college algebra.

Since this indicator is definitely less reliable than the algebra placement test it will not be considered further.

High School Achievement vs. Personality Balance as Indicated by Bernreuter Test Bl-N.

The low correlation of the above values shows that no significant relation exists between these particular data.

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High School Achievement vs. Personality Balance as

Indicated by Bernreuter Test B1-B.

The low correlation of the above values shows that no significant relation exists between these particular data.

The Personality Inventory should be administered to all entering freshmen as at present. The results of the test scoring should be recorded and kept available for the school psychiatrist. These results should be used for reference and as a check upon the judgment of the person who must handle cases which exhibit traces of abnormal tendencies. At the moment it appears that the Bl-N scoring of the test is the most useful and the only one which need be compiled but the other three possible methods of scoring may be used when, as, and if, it becomes desirable.

It goes almost without saying that the results of all of the tests discussed, and particularly the latter one, should be carefully kept from general circulation and discussion. They are designed for reference and use by certain persons of the staff and no good purpose would be served by placing them in the hands of the general instructional faculty.

It is hoped that the conclusions and recommendations arrived at will be useful and serve to give a more definite idea than has previously been available of the relation of the various tests and of their value in predicting success or failure in algebra.

It is not expected that these conclusions are the final word and that they will render unnecessary any further evaluation. Rather, they should serve to eliminate certain tests from consideration and concentrate attention on those

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